Orthodontics

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ABSTRACTS AND REVIEWS
Associate Editor, J. A. Salzmann

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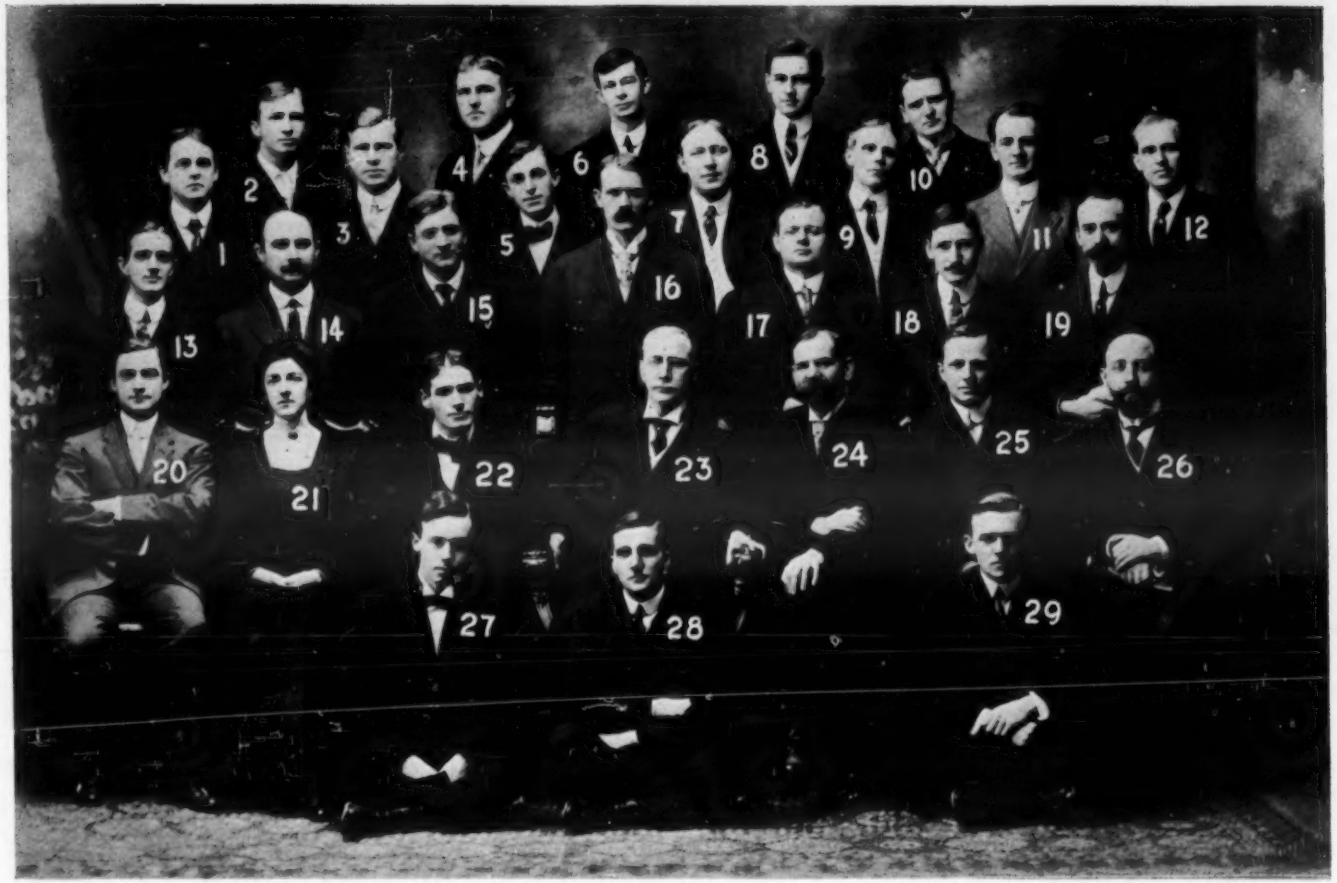

1909 Class of the Angle School of Orthodontia, St. Louis, Mo. *1*, Ira B. Stilson. *2*, E. L. Mitchell. *3*, W. J. Johnston. *4*, C. C. Mann. *5*, B. W. Weinberger. *6*, F. R. Stathers. *7*, George A. Fletcher. *8*, Ralph T. Huff. *9*, E. W. Swinehart. *10*, Hipwell. *11*, L. G. Singleton. *12*, C. B. Steadman. *13*, R. B. Stanley. *14*, M. Hellman. *15*, A. H. Ketcham. *16*, Raymond C. Osburn. *17*, Frank Gough. *18*, A. P. Voislawsky. *19*, H. C. Ferris. *20*, Alfred M. Desnoes. *21*, Guilhermena P. Mendel. *22*, Martin Dewey. *23*, E. H. Angle. *24*, E. H. Wuerpel. *25*, Frederick L. Stanton. *26*, Josef Grunberg. *27*, H. E. Loeffler. *28*, E. S. Friel. *29*, LeRoy Johnson. (Courtesy of Dr. B. W. Weinberger, New York.)

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Original Articles

THE OUTLOOK OF ORTHODONTIC EDUCATION AND LICENSURE

LEUMAN M. WAUGH, D.D.S., F.A.C.D., NEW YORK, N. Y.

WITH a broadening appreciation of the importance of dental health as it bears upon bodily health has grown an increasing consciousness of the need for adequate preparation in several specialties of dentistry. This seems to apply more directly to oral surgery and orthodontics. Further, it seems now to be rather generally accepted, both by leading dental educators and practitioners, that orthodontics has through the past forty years become the *most distinct and clearly defined specialty of dentistry* and the one that for the attainment of the highest type of service requires intensive specialization.*

Although practice of orthodontics embraces the same anatomic area and structures as does dentistry in general, there are certain differences in the application of the fundamental science that separate its practice from the art of conventional dentistry. This distinction is difficult for the average dental practitioner to grasp and is sometimes misconstrued as an effort to exalt orthodontics and to place its practitioners in a group apart as serving on a higher plane. This is surely not the intent of orthodontists. It is simply a direct recognition of what has gradually grown into the consciousness of those dentists who, beginning as recently as about 1900, have become the pioneers of the developing specialty. To become orthodontic specialists they had to proceed in the *hard way* by concentrating their best in time and effort to the limited field, garnering from collateral sciences the knowledge that could be applied through *orthodontic understanding* of fundamentals, which prefaces diagnosis, classification, prognosis, and treatment. While the structures immediately involved in orthodontic treatment are dental, changes brought about in treatment are more closely allied to the field of orthopedic surgery. Orthodontic treatment demands much the same type of mental effort as that accompanying the

Professor of Dentistry and Director of Orthodontics, Columbia University, New York.
Published simultaneously in the *Journal of Dental Education*, January, 1942.
*Childs, Herbert G., Jr.: Graduate Education in Dentistry, J. Dent. Ed. 5: 104, 1940.

treatment of a misshaped spine, a bowleg, or a clubfoot. Correct judgment of reactions to treatment requires intimate knowledge of the changes that take place in living tissues in response to the treatment given. For best results for the patient, the effort must be concentrated and not diverted by such varied demands as those involved in restorative and other procedures in the general practice of dentistry. The position of world leadership that orthodontics in North America has attained is due to the fact that dentists in this country have specialized intensively and have given all of their very best to its development. Divided or miscellaneous practice never could have accomplished this. It has required broad study and extensive investigation in collateral fields of science. The biologist, the anthropologist, the metallurgist, and others became interested and have made very important contributions to our progress. The aim of a few outspoken dentists to relegate orthodontic treatment to the general practitioner and to destroy orthodontics as a dental specialty, is, therefore, regrettable and must be regarded as a retrogressive effort that would be against the public welfare. This attempt would not be made were the facts fully understood. In truth, the efforts of organized orthodontics are not intended to prevent general practitioners of dentistry from entering its ranks, but instead to awaken a realization that to practice a specialty one must undergo adequate preparation to fit himself truly to render safe and beneficial service. It is our aim in this paper to discuss the problem from this viewpoint.

The first specialist in orthodontics was Edward H. Angle, who in 1897 announced his determination to discontinue general dental practice and to engage exclusively in the practice of orthodontics as a specialty. The definition he gave of the special field was: "Orthodontia is that science which has for its object the *correction* of malocclusion of the teeth."* This was the standard definition that prevailed for many years. Then, as knowledge broadened, it became more and more apparent that "correction" must not be the one objective but that, preceding this, there is a very potent purpose that may be expressed in the beneficent term "prevention." The definition was, therefore, amended by others to read: "Orthodontics is that branch of science that treats of the *prevention* and correction of malocclusion of the teeth." As experience broadened, the emphasis on *prevention in orthodontics or preventive malocclusion* has rightly received increasing attention. This broader view of the importance of prevention has become the basis for instruction of the undergraduate student in some dental schools—but more of this later.

As the fundamentals of biology became better understood in their application to the orthodontic problem, and as more knowledge was applied from the collateral sciences, a much broader conception was evolved. This, to my mind, is comprehensively expressed in the definition by the British Society for the Study of Orthodontics: "Orthodontics includes the study of the growth and development of the jaws and face particularly, and the body generally, as influencing the position of the teeth, the study of the action and reaction of internal and external influences on this development, and finally, the prevention and correction of arrested and perverted development."† It is from this broader con-

*E. H. Angle: Malocclusion of the Teeth, Ed. 7, 1907, chapter 1, pp. 7.
†Proceedings of the British Society for the Study of Orthodontics.

cept that in this presentation we shall approach the problem. It will not be our aim to enter into a *detailed* consideration of the curriculum for education in orthodontics, but rather to discuss principles that should underlie proper training for its most effective practice. Coupled with this, for the public welfare, must be the consideration of licensure for the pursuit of orthodontics as a *specialty*. The two related phases, we feel, can be dealt with to advantage in a paper before our general membership. Once having established agreement concerning *principles*, we may well leave details pertaining to curriculum to those of our members who are teachers in orthodontics in the faculties of dentistry. As we see it, this problem may conveniently be considered under four headings:

I. Undergraduate instruction
II. Graduate preparation
III. Advanced courses under university extension and postgraduate courses
IV. Licensure of specialists

Consideration will be given to each of these in order.

I. Undergraduate Instruction.—There are wide differences of opinion among dental faculties as to the purpose and scope of *undergraduate* training in orthodontics. These differences may be indicated by the views of three main groups of teachers:

A. Those who aim to prepare their students for the treatment, after graduation, of the so-called "simple" cases. In these schools, the student has a requirement in clinical orthodontics which he must fulfill to qualify for graduation.

B. Those who stress fundamental science as it pertains to growth and development as related to orthodontics in the fuller sense, with no requirements in either clinical or technical orthodontics.

Best C. Those who teach fundamental science as related to orthodontics, together with a short basal course in laboratory techniques, a clinical demonstration course or seminar, and opportunity to elect work in clinical orthodontics.

Group A, by which a clinical requirement for graduation is imposed, have experienced or observed the following difficulties:

First.—The dental curriculum being crowded with teaching requirements that are strictly within the scope of necessary preparation for the general practice of dentistry, there cannot be allotted, for adequate experience in the treatment of patients, sufficient time to prepare the undergraduate in the application of scientific fundamentals to the philosophy of diagnosis, classification, prognosis and treatment, to enable him safely to attempt orthodontic practice. For this purpose, at least a year would have to be added to his regular dental course. This statement is based on experience over a period of seventeen years with graduate students. Their course was twelve months whole-time in the beginning but has been lengthened to fourteen months whole-time devoted to orthodontics exclusively, and nearly all students at the time of graduation express the wish that they could continue their clinical training for a longer period. The undergraduate student cannot be expected to excel the graduate student in ability to accomplish the work.

Second.—A vote has been taken among undergraduate students for a period of over twenty years to ascertain the number in each class especially interested

in orthodontics and who would like to give additional time to its study as undergraduates. The proportion has varied from 6 per cent to 14 per cent. Therefore, it would surely be unwise to impose an orthodontic requirement on from 86 per cent to 94 per cent of dental students who are not specially interested in the practice of orthodontics.

Third.—Upon inquiry of dentists who have been graduated from schools teaching on this basis, we have been generally informed that their experience in corrective efforts in practice was largely unsatisfactory, and that they either discontinued taking orthodontic patients or did graduate work.

Fourth.—By orthodontists practicing in districts served by graduates from such schools, we are informed that the average of orthodontic service is deplorably low. This is attributed to the lack of a true concept of the possibilities of forthright orthodontics and, as a result, the dentist is unaware of his limitations and incompetence. Having thus begun, perhaps in a smaller community, he continues to duplicate his errors and his patients pay the penalty as well as the price.

We feel that *Group B,* which advocates thorough teaching in the scientific fundamentals related to growth and development without instruction in technique and clinical observation, has taken a position that is too extreme. We agree on the value to the dentist in general practice of a thorough knowledge of growth and development as applied to incipient malocclusion. In fact, we consider it fundamental to all dentistry including, of course, its several specialties. However, we cannot overcome a feeling that the general practitioner should have a general understanding of basal orthodontic technique. He will not infrequently be called upon to remove appliances that are uncomfortable or may need temporary repair, as in summering communities, or when having to do restorative work for children wearing appliances, and we feel he should at least be competent to remove appliances properly. Then, too, we feel that the undergraduate student should be acquainted with the limitations and possibilities of orthodontic treatment. This can hardly be impressively taught without demonstration upon the patient undergoing treatment. Especially important, we feel, is the progress study of younger patients who are under observation for natural growth changes. This will serve to give clinical application to the biologic fundamentals stressed in the lecture course. We are strongly in favor of electives and feel that the faculty should afford opportunity to take them.

Group C gives, in general, the course and opportunities that we have endeavored to work out and have followed for the past twenty-five years with such modifications as increasing knowledge and experience have suggested. It is offered quite humbly with the hope that your suggestions may lead to its improvement.

The course in orthodontics for undergraduate students—junior year—5 credits, totaling 110 hours, plus extra preparation hours—may be conveniently considered under four headings:

I. Didactic course
II. Demonstration clinic course or seminar
III. Laboratory basic technique course
IV. Elective clinical course

*I. The Didactic Course** embraces 30 hours of lectures, recitation and quiz work, for one trimester, 2 hours per week, with special sessions of 10 hours.

Outline.—Introduction, definition—brief history from Hippocrates to the present. Development of modern orthodontics.

Correlated Sciences

Biology { Morphology { Anatomy / Histology—Embryology
Physiology related to dental organs

Contemporary Practice.—Dentistry, medicine, surgery, rhinology, pediatrics, orthopedic surgery.

The orthodontic problem is studied under four general divisions:

a. Prevention in orthodontics or preventive malocclusion
b. Corrective orthodontics
c. Post-treatment observation
d. Orthodontics for adults

a is primarily the duty of the general practitioner of dentistry and is the basis of the undergraduate course.

b is the duty of the specialist in orthodontics, preferably one who limits his practice to orthodontics.

c is the duty of the specialist for a period after active treatment has been completed, and then of the general practitioner who observes and refers the patient back in case of threatened relapse.

d may be given by either the dentist or the specialist since it involves only tooth movement.

The lectures emphasize the progressive physiologic growth and development, from conception to adulthood with special reference to the head, face, jaws, and teeth. The normal in function and structure is continually stressed as the basis from which the abnormal must be judged. The development of the average normal deciduous denture from embryonic life to completed occlusion, the gradual shedding of deciduous teeth, and replacement by their permanent successors are studied in minute detail to the completion of normal adult occlusion. Special emphasis is placed upon the early recognition of conditions in the growing child and his developing dentition that predispose to malocclusion. Means for their early remedy are discussed and strongly emphasized as the duty of the general practitioner in dentistry. Among these are:

a. Proper suckling—correctly formed artificial feeding nipples
b. Thorough mastication—importance of chewing resistant foods
c. Pressure habits detrimental to normal growth, as thumb-, finger-, tongue-, lip-, and cheek-sucking and biting
d. Developmental spacing of deciduous incisors
e. Proper restoration of deciduous tooth form when fillings, inlays, etc., are placed
f. Premature loss of deciduous teeth and space maintainers when indicated

*Outline appended.

g. Harm that results when deciduous teeth are too long retained
h. Missing tooth follicles
i. Supernumerary, transposed, malformed and impacted teeth
j. Loss of permanent teeth, especially the first molar
k. Proper dental restorations in deciduous teeth and proper replacement of lost permanent teeth

Predisposing causes are also dwelt upon under the following general systemic divisions:

a. Endocrine imbalance
b. Metabolic disturbances
c. Acute or chronic infections and deficiency diseases
d. Prenatal abnormalities
e. Congenital defects
f. Heredity
g. Unknown causes (as yet)

Classification of malocclusion—Angle.

The advantages of gnathostatic procedures (Simon), including a demonstration of the progressive steps in impression-taking, use of face-bow, mounting, charting, photostatic facial reproductions, terminology, and interpretation and measures to be resorted to in overcoming incipient malocclusion.

The undergraduate is impressed with the fact that by knowing and doing his duty to the patient, *as a general practitioner* of dentistry, he will prevent the need for at least 35 per cent of the corrective orthodontics now required of the specialist, and that "prevention is nobler than cure," and is the only hope by which the orthodontic problem can be solved for the laity. The impossibility of giving the undergraduate adequate clinical training in the time available is discussed with the class. The ethical principles involved in his understanding of the responsibilities of treatment, in any part of dentistry for which he has not been prepared by thorough clinical experience, are discussed in class conference. The moral and legal aspects involved in the use of orthodontic appliances of laboratory origin are stressed.* He is informed of the law in New York and in other states under which it is illegal to use appliances of laboratory planning and manufacture. He is advised to take a graduate course if interested in corrective orthodontics.

II. Demonstration Clinic Course or Seminar.—25 hours—10 sessions of 2½ hours each, for one trimester. Clinic patients under treatment in the graduate course are used for demonstrations by the clinical instructors. The class is divided into sections of eight students each and assigned to a designated clinical instructor for each session. Patients undergoing treatment for incipient malocclusion are segregated, and the teachers cover a definitely planned part of the work by following identical outlines, the several sections thus receiving similar instruction at each session. This closely supplements the lectures, and the salient points as observed and studied on patients are emphasized in regular group conferences.

*Waugh, L. M.: Orthodontic Appliances of Laboratory Origin, N. Y. J. Dent. 9: 57, 1939.

*III. Laboratory Basic Technique Course.**—50 hours, 20 sessions of 2½ hours each, for one trimester.

IV. Elective Clinical Course.†—Offered for both Junior and Senior students—30 clock hours for Juniors and 60 hours for Seniors. It is with regret that we must report that undergraduate students have been unable to find time for an elective during the past four years; an effort is being made to remedy this condition.

The undergraduate part of the larger problem has been dealt with in some detail because the attention of dental faculties is now converging on the solution of this vexed question. A study is now being made by several committees representing different associations, with the hope of deciding soon whether undergraduate training shall prepare the dental student for orthodontic practice or whether this preparation shall be the function of graduate education. Therefore, in this presentation, special thought will be directed to this part of our entire problem. When the problem relating to the undergraduate curriculum is solved to the general satisfaction, the graduate curriculum will be well on the way to solution by teachers in graduate orthodontics—members of this Association I trust—functioning as members of dental faculties.

II. The term *graduate work* will be used to imply an organized, formal course of study under university discipline directed by the faculty of a dental school or a department of a university.

III. The term *postgraduate work* will be applied to instruction of informal status in the university, such as that given under university extension—advanced and refresher courses.‡ These carry no university credit. (A better term seems desirable.)

Graduate work is conducted in most universities under the auspices of a graduate faculty which is separate and distinct therein from any school or department. Graduate work is rated as the most advanced, academically, of any in the university. Eligibility is dependent upon a baccalaureate degree. Completion of extended courses may lead to the award of advanced degrees, such as Master of Science and Doctor of Philosophy. Original research in the study of a major problem, with approved thesis, may be a prerequisite for a graduate degree. This may be awarded by the Trustees for advanced work in any one of a goodly number of educational and scientific fields. In one university—Illinois—orthodontics has been recognized and accepted by the graduate faculty. I should like here to salute our fellow members Doctor Frederick B. Noyes, under whose deanship this was obtained, and Professor Allan G. Brodie who, as Director of the Department of Orthodontics, had the task of qualifying with the Graduate Faculty. At Illinois, students majoring in orthodontics, who meet the standards, are awarded the degree of Master of Science.§ Clinical work is not recognized or credited by graduate faculties. Graduate study is also approved, in a number of universities, under the direction of the faculties of some of the schools and departments. Dental faculties in several

*Outline appended.

†Outline appended.

‡Waugh, L. M.: To What Extent and by What Means Should Dental Schools Provide Postgraduate Extension Work for the Practicing Dentist? J. Dent. Ed. 4: 321, 1940.

§Brodie, Allan G.: Graduate Work in Orthodontia, J. Dent. Ed. 2: 226, April, 1938.

universities are functioning under this provision. The D.D.S. and D.M.D. degrees from recognized university dental schools qualify ethical applicants for admission. Such courses are definitely planned as to content and academic rating and have the advantage of integrating the required major with dental studies, and clinical work is required and credited toward the completion of the course. This is of great advantage to graduate students in orthodontics who are preparing to devote their time to practice either wholly or in combination with part-time teaching. The degree awarded by a graduate faculty has the advantage of being recognized by officers in the university in general as equivalent to all others. This is helpful to orthodontists who are preparing to follow a whole-time teaching or research career, as it tends to establish academic equality with similar workers in other fields of research and teaching. It is not so important to those who intend to follow a career in practice and clinical work.

The accorded recognition of graduate work done under regular dental faculties varies greatly. In some universities the degree of Master of Science in Dentistry, M.Sc.D., or Doctor of Science in Dentistry, D.Sc.D., is approved. In others no degree is awarded. Columbia University may be used as an example. There the Trustees do not award a degree for graduate work in clinical dental subjects, but in its place award a Certificate of Proficiency. This may be earned in Orthodontics, Oral Surgery, or Clinical Dentistry, depending on the nature of the major work. This plan is followed also in several other schools of the University and was in existence before the Dental School was organized. The minimum number of credits for a Certificate of Proficiency in any school of the University is 44. Comparing this with the 34 that is generally rated as the requirement for an academic year—eight months—it is seen to be the equivalent of approximately a calendar year—12 months. In the Division of Graduate Orthodontics, the course may be taken in 14 months whole-time or 26 months half-time, each plan having a vacation allowance of one month. The academic credits earned by either plan number 64—or the equivalent of almost two academic years of credit. Practically the same majors in the fundamental sciences are required as under the graduate faculty, plus special lectures by the several departments of dentistry and medicine that are related to orthodontics. The effort is to promote a spirit of inquiry and investigation, often called research. A thesis, with some original contribution, is a prerequisite for the award of the Certificate of Proficiency. By this procedure the hours for clinical training are greatly increased.

From our experience some years ago, in offering a course in which dentists were enrolled to attend for a part-time course on a basis of less than half-time, we are strongly of the conviction that this extended part-time plan so dilutes the seriousness of the effort in orthodontics that such courses should be classified as postgraduate. Such students are mostly concerned about technical training and are not interested in biologic fundamentals. These courses, we feel, should not be acceptable for university credit or recognition by organized orthodontics.

IV. *Licensure of specialists in dentistry* is now receiving more general consideration than ever before. The need of setting up standards is being recog-

nized by practitioners, educators, and legislators alike. The public welfare requires that this be done. The council on Dental Education of the American Dental Association has appointed a subcommittee to make a study of the specialties in dentistry and the public welfare, naturally, will be one of the major considerations. Two general plans have been suggested for study.

I. Legislation somewhat similar to that for the present dental graduate.

II. The plan prevailing in medicine through the agency of certifying boards. Orthodontics has had such a board since 1929. Within the past year, the American Academy of Periodontology has created one. An advisory board for medical specialties was organized in 1933-34, to coordinate graduate education and certification of medical specialties in the United States and Canada. At present sixteen branches of medicine are recognized as suitable fields for the certification of specialists. It is aimed through these boards to control specialization so that state laws for licensure of medical specialists will not be needed. The advisory board for medical specialties states as one of its objects the following: "A special board should (a) determine whether candidates have received adequate preparation, (b) provide a comprehensive test of the ability and fitness of such candidates, (c) certify to the competence of those physicians who have satisfied its requirements."*

This advisory board "functions in close cooperation with the Council on Medical Education and Hospitals of the American Medical Association." In this we feel the great difference between the influence of certifying boards in medicine and in dentistry. The close collaboration between the boards and the hospitals, in medicine, makes it impossible for a physician or a surgeon to become a member of a Class A hospital staff without having been certified by the board of his specialty. Therefore every physician and surgeon, desiring hospital affiliation, must pass the board of his specialty. This he does just as soon as possible after graduation, as hospital connection is essential to his attaining prominence among physicians, surgeons, and the laity.

In dentistry no such requirement is as yet existent. There is no compelling force to influence recent graduates to qualify with a certifying board. The progressive and leading members of specialties will naturally do so, even though the hospital or clinic recognition of certified dental specialties is not as yet in effect. We eagerly hope that it may before long become a requirement for all appointments to hospitals and clinic staffs, except for internship upon graduation. In the meantime, we strongly feel some means *other* than certifying boards must be used to protect the public from the ignorant and the unscrupulous dentist who holds himself out as a specialist without adequate preparation. This, we feel, must be by state legislation. In advocating this, we recognize the fact that we are not paralleling medicine and surgery. We hope for the day when all dental graduates will have inculcated into their very souls a concept of ethics as deep and as fine as that of the graduate in theology. Then no dentist will be tempted to undertake any form of treatment for which he has not been adequately prepared. But what in the meantime? No undergraduate school in either dentistry or medicine has ever even pre-

*Advisory Board for Medical Specialties, edition 1939, p. 12.

tended to prepare the student in his undergraduate course for specialization upon graduation. *In both professions graduate work is essential.*

The current diversity of opinions among dentists regarding adequate requirements for specialization recalls the similar situation in medicine as recently as 1930, when the Annual Report of the Carnegie Foundation for 1930 quoted recent authoritative comment (1929), on conditions in medicine in the United States, in part as follows (page 86):

"There is no control over physicians who propose to practice a medical or surgical specialty or who are doing surgery, nor is there any prescribed method of procedure by which they may qualify as specialists. . . . The courses which are available are inadequate numerically for the large number of men who should take advanced work in order to prepare themselves for the practice of a specialty. The great majority of men simply have to shift for themselves. They may work in an outpatient clinic and pick up what they can without proper guidance, or they develop skill on private patients who come to them, or they go to Europe or to one of the postgraduate schools of this country for a short course. If they have ability they will overcome all the difficulties and eventually develop into good specialists. This is the course many of our prominent men have followed, but it is unsatisfactory even for them. . . . Evidently some way must be found, not only to guide along definite lines a young medical man seeking to practice a specialty, but to compel him to have special training before he is allowed to engage in a specialty. To be called a specialist, whether in general surgery or any surgical specialty, or in the various branches of medicine, should indicate to the profession, as well as to the public, that he has special qualifications and has had special training beyond that required of the general practitioner."

Medicine has been responding effectively to such constructive criticism and, in its educational efforts, has been receiving hearty approval in the universities. May we not expect that dentistry, which is now alert to its educational responsibilities, will be equally responsive to the same ideals of progress and also have the active interest and support of educators and university officials—for dentistry is an essential division of health service and as such will be needed and sought, with cumulative concern, by an appreciative public.

We believe that no one will deny that certain specialties in dentistry are necessary for the best oral health care. That orthodontics is one of the most clearly defined of these specialties is now being recognized. That the dental student is not adequately prepared in undergraduate courses to administer orthodontic treatment and needs graduate work for that purpose must also be apparent.

If certification by the specialty boards—in this instance the American Board of Orthodontics—requires 5 years of intensive specialization as a prerequisite for the examination, how is the orthodontic patient, the growing child, to be protected during this minimum of five years of such practice except by *legislative means.* We have sought earnestly for a better way but none has been found. Therefore, we must advocate this means of protection of the public. That the problem has not been confined to our locality is evidenced by the fact that the difficulty has been acute in other states, for in four legislation pertaining to the specialties has been enacted. These are Illinois, Oklahoma, Ten-

nessee, and Michigan. From what we have learned these laws are very helpful, although possibility of improvement is becoming apparent with experience. The author has been a member of several committees that studied problems pertaining to specialties during the past years. We are informed that a new clause might have to be added to the New York state law to bring about the desired protection. However, within recent months the New York State Board of Dental Examiners and Board of Regents of the University of the State of New York have readopted the interpretation that was applied to the existing statute prior to 1932. This has been attested by the recent report of the Committee on Proprietary Schools in the Dental Specialties of the First (N. Y.) District Dental Society.*

Thus, in New York state there is a statute that was enacted years ago. Although it was not applied for a period, it is now being enforced. By this means we have been enabled to protect the public without the enactment of special legislation. This we regard as most fortunate, for new laws, particularly when restrictive in effect, are bound to create dissatisfaction, especially when men's pocketbooks are touched. May we suggest that quite possibly in the existing laws of other states, there may be found provisions which, if enforced by the respective state dental examining boards, would satisfy the specialist's desire for proper protection for the people?

In closing, may we reiterate that organized orthodontics is not endeavoring to prevent any dentist from doing orthodontics. It is united, however, in bringing about conditions that will require him adequately to prepare himself in the fundamentals underlying this special work so that he can safely undertake treatment of patients. We firmly believe in the ethical principle that no practitioner in the health services should allow himself to undertake a treatment for which he has not made adequate preparation. We believe, further, that examining boards which grant the license to practice under the laws of the states do so in the spirit of the pledge expressed in the Hippocratic Oath, which we and many other dental graduates affirmed when receiving our diplomas. May we all keep this solemn pledge alive within us and be guided by it in our daily lives.

ORTHODONTICS

OUTLINE OF COURSE FOR UNDERGRADUATE STUDENTS

May be conveniently divided under four headings:

I. Didactic Course

II. Demonstration Clinic Course

III. Laboratory Technique Course

IV. Elective Clinic Course

I. The Didactic Course embraces 30 hours of lecture, recitation and quiz work, for one trimester 2 hours per week, Senior students—See appended outline.

II. *Demonstration Clinic Course*—30 hours, 15 sessions of 2 hours each, for one trimester, Senior students. The class is divided into sections of eight students each and assigned to a designated clinical instructor for each session. Patients undergoing treatment for incipient malocclusion are concentrated and the teachers cover a definitely planned part of the work by following identical outlines by which the several sections receive

*Report appended. Adopted unanimously by the Council of the Dental Society of the State of New York, May 12, 1941, and presented to the State Board of Dental Examiners and the Board of Regents of the University of the State of New York.

similar instruction at each session. This closely supplements the lectures, and frequent quizzes bring out the salient points as observed and studied on patients.

III. *Laboratory Technique Course*—15 sessions, 2½ hours each, for one trimester, Junior students—See appended outline.

IV. *Elective Clinical Course* offered to both Junior and Senior students—See appended outline.

I. *Didactic Course: Outline*

Introduction—Definition—Brief History—Development of Modern Orthodontics.

Correlated Sciences:

Biology { Morphology { Anatomy / Physiology { Histology—Embryology

Contemporary Practice—Dentistry—Medicine—Pediatrics—Orthopedic Surgery.

Studied under four divisions:

a. Preventive malocclusion or prevention in orthodontics

b. Corrective orthodontics

c. Postcorrective observation

d. Tooth movement for adults

a and c. Primarily the duty of the general practitioner of dentistry.

b. The duty of the specialist in orthodontics.

d. Duty of both dentist and specialist.

The lectures emphasize progressive growth and development from the embryo to adult with special reference to the head, face, jaws, and teeth. The normal is continuously stressed as the basis from which the abnormal must be judged. The development of the normal deciduous denture to completed occlusion, the gradual loss of deciduous teeth, and replacement by their permanent successors is studied in minute detail to the completion of normal adult occlusion. The undergraduate is impressed with the fact that by knowing and doing his duty to the patient, as a general practitioner of dentistry, he will *prevent* the need for at least 35 per cent of the corrective orthodontics now required of the specialist, and that "Prevention is nobler than cure" and is the only hope by which the orthodontic problem can be solved.

January, 1934

Submitted by

DR. L. M. WAUGH

COLUMBIA UNIVERSITY DEPARTMENT OF ORTHODONTICS
LABORATORY TECHNIQUE

I. *Freehand Soldering Exercises*

A. Instruction in blow pipe flame. Position of body, arms and fingers. Proper grip.

B. Straight piece—¼ inch sections—2 butt joints followed by 2 45 degree bevel joints. .030 wire. High-fusing solder.

C. 90 degree piece—¼ inch sections—45 degree bevels. Eight joints—.030 wire. High-fusing solder.

II. *Upper Cast*

A. *Anchor bands* on left and right permanent molars.

(1) Left molar band to be made *directly* on the tooth with lap joint on *lingual*. High-fusing solder.

(2) Right molar band to be made indirectly—*Demonstration by instructor*. .006x.20 band material.

(a) Round tube placed horizontally on buccal.

(b) Half-round tube placed vertically on lingual. *Low*-fusing solder.

B. *Plain labial arch*—.036 wire—.022 hooks soldered to gingival aspect of arch—at mesial end of buccal tubes, to hold arch in place, and to serve as stops. Low-fusing solder.

On left side—long hook for *inter*maxillary elastic in region of cuspid. .030 wire. Low-fusing solder.

On right side—45 degree hook for *intra*maxillary elastic in region of cuspid. .030 wire. Low-fusing solder.

C. *Upper lingual arch*—half-round posts soldered with high-fusing solder. .028 locks. Low-fusing solder.

On right side—single auxiliary spring. .022 wire—attach in the region of the interproximal space between the first permanent molar and second deciduous molar, on gingival aspect of arch. Run mesially to include cuspid. Low-fusing solder.

On left side—a recurved spring to include upper left first and second deciduous molars. .022 wire. Low-fusing solder.

Thumb-sucking spurs .030 wire. About 3 mm. in length. Low-fusing solder. (See chart for location.)

D. *Pinch band* on upper right central of .003x.17 band material. Joint on lingual, in center of lingual surface, using *high*-fusing solder.

Lingual rotating spur, .022 wire, using *low*-fusing solder.

III. *Lower Cast*

A. Anchor band on lower left first permanent molar—.006x.20 band material, soldered with high-fusing solder, seam on *buccal*. ½ round tube soldered vertically on lingual, mesial to mid-point. Hook of .030 wire soldered over buccal seam, using low-fusing solder.

B. Pinch band on lower canine. Lap joint on lingual. .003x.17 band material. High-fusing solder.

.030 spurs soldered to central gingival area of buccal and lingual surfaces. Low-fusing solder.

C. Band lower right first deciduous molar. .006x.20 band material. Joint on buccal. High-fusing solder. Cleat of .030 wire.

D. Space retainer from lower left first permanent molar to lower left canine, looping about the lower left premolar, lingual to the gum line to rest on lingual spur of canine. .036 arch wire. Solder .030 clasp to retainer, just distal to canine, to rest on labial spur. Make as lingual arch with half-round post and lock.

E. Space retainer from lower right first deciduous molar, extending to mesial surface of lower right permanent molar. .030 wire. Low-fusing solder.

NOTE.—In working precious metals the designations "high-fusing solder" implies 22K. gold solder, and "low-fusing solder" 18K. For repairs, 14K. gold solder may be used if preferred.

REQUIREMENTS FOR STUDENTS TAKING ORTHODONTICS AS AN ELECTIVE

Those students electing 1 credit are required to do as a minimum: (a) 2 plaster impressions and produce 1 set of record casts; (b) make and place 1 space retainer; (c) make 4 anchor bands by the indirect method and 2 lingual arches or 1 lingual and labial arch for a practical case. This is done under the direct supervision of the technicians. The student assists in the cementation of bands and the passive placement of the arches. (d) placing separations in the mouth. (e) The student is quizzed by the instructor on the classification of the cases under treatment. The student is permitted to do as much work in the mouth as his instructor considers safe for *the patient*.

For 2 credits there is required further technical training, with a minimum of 3 space retainers; 3 sets of impressions; 3 sets of appliances, cementation of bands, and adjustment of appliances under direct supervision. The individual ability of the student determines the amount of treatment he is permitted to do on the patient. The "welfare of the patient must be conserved."

FINAL REPORT OF THE SPECIAL COMMITTEE ON PROPRIETARY SCHOOLS IN THE DENTAL SPECIALTIES FIRST DISTRICT DENTAL SOCIETY
ADOPTED BY THE BOARD OF DIRECTORS—APRIL 7, 1941

I

A progress report was presented on May 6, 1940. With that report, the proposed questionnaire to be sent to the heads of the proprietary schools in dental specialties located in the first judicial district was presented, together with letter to accompany the questionnaire and a follow-up letter if needed.

The Board of Directors authorized the Chairman to consult with the Society's counsel, Mr. Latson.

The Chairman reported that he had been invited to attend a joint meeting of the State Board of Dental Examiners and the Board of Regents in Buffalo, N. Y., on May 15, 1940. He said he might want to ask what influence refusal to answer the questionnaire might have on the renewal of temporary licenses. He also might wish to ask if the Regents could help in getting the answers. The following letter of May 10, 1940, expresses the action taken:

> "Dear Doctor Waugh: This is to verify action of the Board of Directors at their meeting on May 6 in the acceptance of your report as Chairman of the Committee on Proprietary Schools, and their vote of confidence. Your very truly, (signed) John L. Peters, Secretary."

II

Progress Report of Committee on Proprietary Schools in the Dental Specialties located in the first judicial district, Feb. 3, 1941:

Sent questionnaire and letter No. 1, registered, to:—

Institute of Orthodontia, 133 East 58th Street, N. Y. C.
Dr. Egon Neustadt, Director

Dewey School of Orthodontia, 17 Park Avenue, N. Y. C.
Dr. Harry Abelson, Director

New York School of Orthodontia and Oral Surgery,
36 West 59th Street, N. Y. C.
Drs. Morris I. Schamberg & Samuel Abraham, Owners and Teachers

New York Orthodontia Preparatory School, 1240 Park Avenue, N. Y. C.
Dr. A. Lincoln Adelman, Director

Answers have been received from all by mail.

Dr. Neustadt, Institute of Orthodontia, answered as follows: "My dear Doctor Waugh: The First District Dental Society's recent decision to bar from the pages of its Journal the announcement of the Institute of Orthodontia—despite its authorization from the Board of Regents—makes it evident that the Society's attitude in this matter is not unbiased. The Institute is, for this reason, constrained to decline answering the questionnaire. Yours truly, (signed) Egon Neustadt."

Dr. H. Abelson, Dewey School, turned the questionnaire over to his attorney, Nathan A. Goldenthal, who wrote: "I believe that an examination of the papers filed with the University of the State of New York will answer all of your questions and give you all the information which you desire to have. I believe that there is nothing that either my client or I can add to the material now on file with the Board of Regents."

Dr. Morris I. Schamberg, New York School of Orthodontia & Oral Surgery, wrote as follows: "My dear Doctor Waugh: In response to the communication sent by your committee in reference to the post graduate instruction of oral surgery which I have been giving dentists for many years, permit me to state that when we applied to the Regents for a license to conduct a Post Graduate School in Orthodontia and Oral Surgery we were confronted with obstacles which caused us to abandon the school idea and revert to private practice courses. These I give in my private practice and at the several hospital clinics that I attend. Trusting that this gives the desired information, Sincerely and fraternally yours, (signed) Morris I. Schamberg."

Dr. Samuel Abraham wrote and sent an outline of his course in orthodontics: "My dear Doctor Waugh: Answering your letters of April 27 and May 3, I would state that the N. Y. Post-Graduate School of Orthodontia and Oral Surgery has cancelled its announcements in the dental journals as of November 1, 1939. Since that time, graduate dentists have been accepted only as private students receiving personal instruction. Instruction is given at my office and laboratory and at the clinics that I am associated with. .The enclosed bulletin describes in detail the scope of the post-graduate instruction given by me. Very truly yours, (signed) Dr. Samuel Abraham."

Dr. A. Lincoln Adelman, New York Orthodontia Preparatory School, answered under date of June 19, 1940, as follows: "As I am reorganizing my course during the summer, I will not be able to categorically answer the questionnaire." The following, from a letter sent by Dr. Adelman to an inquiring student (Ackerman), June 19, 1940: "I am pleased to state that Doctor Samuel Woolf, one of my first students, of 119 West 57th St., Manhattan, has contracted for over nine times the amount paid me for instruction."

III

We attended the meeting called by the State Board of Dental Examiners in Buffalo, May 15, 1940. Drs. Franklin A. Squires and Glen H. Whitson represented the New York Society of Orthodontists, and each presented a prepared address expressing the sentiment of the Society. There was a lengthy and constructive discussion, in which we were asked to present our views on orthodontic education. In this we spoke also on commercial and proprietary schools, emphasized their lack of facilities, faculty, etc., as outlined in our questionnaire. Dr. Milton E. Loomis, Associate Commissioner and Acting Assistant Commissioner for Higher Education of the University of the State of New York, was present and took an active part. He expressed deep interest in the Committee's work. He informed us that the Board of Regents would conduct a special survey and asked if there would be any objection to his using our questionnaire. We gladly supplied him with a copy. This was followed by considerable correspondence. His attitude led us to feel that he and the Board were in accord with our standards. We asked what influence a refusal to answer the questionnaire would have, and were informed that it would have a decidedly detrimental influence; and that it would not be necessary for your Committee to make an effort to force answers, as the Regents could demand answers under penalty of refusal to renew the temporary licenses under which the proprietary courses were permitted to operate. The State Board of Dental Examiners asked if each member of the Board could be sent a copy of the questionnaire and of some of the correspondence. This was done. The State Board of Dental Examiners also called a hearing on this subject on Dec. 2, 1940. Dr. Harlan H. Horner, who preceded Doctor Loomis in office and who is now Secretary of the American Dental Association's Council on Dental Education, was present by invitation and addressed the meeting.

The Dental Society of the State of New York has appointed L. M. Waugh Chairman of a Committee on Dental Specialization, the work of which closely parallels the work of this First District Committee in some respects. At the meeting of this latter committee held in Buffalo, Jan. 12, 1941, with Doctors Horner, Montgomery, Pankow, Holliday, Brodie, and F. B. Noyes present by invitation—in addition to our State Committee—we had an intensive three-hour discussion, the result of which seemed to indicate that we are reaching an accord on the elimination of proprietary and commercial courses, schools, clinics, etc. We feel that your Committee has made substantial progress in attaining an end for which President Schuyler first appointed it. We want to express our appreciation of its continuance through the administrations of Presidents Morse and Fennelly. This feeling of progress is based on two letters from Dr. Minor J. Terry, Secretary of the State Board of Dental Examiners, and one from Commissioner Graves. Quoting from a letter, dated March 1, 1940, received from Dr. Frank P. Graves, then Commissioner of Education of the State of New York: "I am in complete agreement with you that the proprietary principle should not obtain in any area of higher and professional education, and I look forward to the time, not far distant, when it will be possible for the Department to refuse to countenance the continuance of proprietary institutions such as these."

Permission to quote the following was given by Secretary Minor J. Terry of the State Board of Dental Examiners; it is from his letter under date of Jan. 2, 1941, to President W. Ray Montgomery of the Dental Society of the State of New York: "For your information I am quoting below excerpts from the minutes of the annual meeting of the State Board of Dental Examiners, held in New York City on Dec. 3, 1940: After thorough discussion 'On motion it was voted that a reinspection of postgraduate schools of orthodontia be requested, and the report be sent with certain recommendations to the department, before any permits are issued to such post-graduate schools. 'On motion it was voted that the Board of Dental Examiners recommend to the Regents that all postgraduate schools of orthodontia be required to consummate an organic connection with a registered and approved university. 'On motion it was voted that a copy of this resolution be sent to the Executive Council of the State Society.' "

Excerpt from letter from Dr. Minor J. Terry, Secretary of the New York State Board of Dental Examiners, under date of *June 16, 1937:* "In reply to your letter of the 14th instant, beg to advise that all 'bally-hoo' signs made use of by a dentist in general are prohibited under the Statute whether such statements are advertised on 'milk signs' or displayed on the windows. However, a man who confines his practice exclusively to Orthodontia or any other specialty in dentistry, should be permitted to announce this fact upon his signs, but the general practitioner who attempts to solicit patronage by attempting to indicate that he is specializing in any branch of dentistry would be misleading and deceptive and, therefore, would be prohibited under the Statute. I would appreciate it if you would send me the names and addresses of any dentists who are violating the law with respect to the displaying of the above-mentioned signs."

We have been reliably informed that the State Board of Dental Examiners is now enforcing these rules. If these two actions of the State Board are sustained under the present law, we shall have gained our objective without seeking special legislation. This, we feel, is preferable. Restriction under a new law always makes enemies for those who brought about the enactment.

Respectfully submitted,

April 7, 1941

LEUMAN M. WAUGH, Chairman
HENRY SAGE DUNNING
EARLE BANKS HOYT
ARTHUR H. MERRITT
ALLEN T. NEWMAN
ALFRED S. WALKER
WILLIAM J. GIES, Counsellor

A CLINICAL STUDY OF OPEN-BITE

EARL W. SWINEHART, D.D.S., BALTIMORE, MD.

OPEN-BITE has long been one of the most controversial subjects among orthodontists. However, despite continuous discussion antedating even the founding of the specialty, there seems to be more confusion of thought and opinion now than ever. Judging by the literature and heart-to-heart talks among us, there still exists a general dread of meeting this malocclusion in practice, a feeling of incompetence of orthodontic measures to deal with some uncontrollable unknown in open-bite that does not seem to exist to as great extent in relation to other malocclusions. Some think the prognosis is so bad as to render attempts to treat it unjustifiable. Henry Hoffman in 1938 called the attention of this Association to these things and urged combined study to determine whether or not orthodontists are capable of treating open-bite with a reasonable degree of success. He was unquestionably right.

The author had begun thinking more seriously on this subject several years before Dr. Hoffman's paper was read. It decided him upon a systematic clinical study, the first step being to select all open-bite cases from a file of twenty-seven years of practice. Here was encountered the first stumbling block—to determine accurately just which cases might be classed as open-bite. This uncertainty in classification probably is one of the main reasons that so much confusion of thought has retarded progress in dealing with the problems of this abnormal condition. Angle's precise and unequivocal definition of the three classes of malocclusion is the basis of successful orthodontic treatment. The profession has lost much through lack of such an exact definition of openbite. It is frequently stated that some cases are "true" and all others "pseudo" or "false" open-bite. Each man has his own individual opinion of just how this is determined. What constitutes the borderline between so-called "true" and "false" cases? In reality, no bite which is open can be false. Certainly the patient thinks it is true when he comes for treatment. The terms "false" or "pseudo" are often used when the condition involves only the anterior teeth, yet open-bite of the anterior teeth only may be just as unsightly and quite as difficult to correct permanently as open-bite associated with complicated general malocclusion.

Constructive group study of any subject must necessarily depend upon common understanding of the data presented from various sources. It seems evident, therefore, that a prerequisite of efficient professional study of the etiology and treatment of open-bite is first to adopt a clear, concise, and all-inclusive definition of the physical attributes of the condition itself. Consideration of etiology should have no place in this basic description of this entire group of malocclusions. As all open-bites are true, the terminology of open-bite should be rid of such misleading and impossible terms as "false" or "pseudo."

Read before the Fortieth Anniversary Meeting of the American Association of Orthodontists, May, 1941, New York City.

As a tabulation of the open-bite cases in the author's practice is to be presented at this time, it was desired that you should know by what standard the cases were judged. The following definition was adopted after consultation with a number of experienced orthodontists. *Open-bite is an abnormal condition in which groups of teeth do not make occlusal contact because of lack of requisite vertical extension.* It is hoped that this definition will make the tabulation understandable. It does not limit the location, size, or pattern of the space between groups of teeth of the two arches nor is it concerned with etiology. It excludes instances in which single teeth fail to make vertical contact.

The tabulation contains all of the open-bite cases in the author's files. In order to minimize error they were segregated and then judged according to the above definition, with the aid of two other orthodontists.

There was a total of 115 cases. Sixty-four were in Class I, forty-six in Class II, and five in Class III. The second column presents these figures in

TABULATION OF OPEN-BITE

	NUMBER	PERCENTAGE	PERCENTAGE OF ALL MALOCCLUSION (ANGLE)	REGION OF OPEN-BITE								ABNORMAL MAX. OCCLUSAL PLANE	ABNORMAL MAND. OCCLUSAL PLANE	MAXILLARY INCISAL LABIAL TIPPING	MANDIBULAR INCISAL LABIAL TIPPING
				INCISORS	INCISORS-CUSPID'S	CUSPIDS-PREMOLARS	PREMOLARS ONLY	INCISORS-CUSPIDS 1ST PREMOLARS	INCISORS-CUSPIDS PREMOLARS	INCISORS-CUSPIDS-PREMOLARS-1ST MOLARS	POSTERIOR TEETH				
Class I	64	55.6	69.2	48	11		2	3				64	21	46	0
Class II	46	40.0	26.6	25	14		1	4	1	1		46	3	24	0
Class III	5	4.4	4.2			2	1		1		1	5	1	0	0
Total	115	100	100	73	25	2	2	6	5	1	1	115	25	70	0

Fig. 1.—A tabulation of open-bite cases in the author's practice. (For detail see text.)

terms of percentage. In order to determine which class was more favorable to the formation of open-bite, Angle's percentages of all malocclusion in the three classes were set up in column three for comparison. The next eight columns show the region in which the open-bite was found. If, in judging the cases, the space extended farther back on one side, that side was used to indicate the extent.

Analytic study of this tabulation of cases will reveal some pertinent facts of value in determining the etiology of open-bite. By comparing the percentages in columns two and three for each of the classes, it will be noted that the least tendency toward open-bite was in Class I; it was very strong in Class II, while Class III relationship and morphology did not seem to exert either an encouraging or discouraging influence. The extraordinary tendency to open-bite in Class II is better appreciated by noting that there were almost three-fourths as many of such conditions associated with Class II as with Class I although according to Angle there are three times as many cases in Class I as in Class II.

Examination of the figures in the columns showing the regions in which open-bite was found reveals that the character of the condition varied markedly according to the class in which it occurred. As seen in Class I the open-bite was usually of the more simple type and in most cases involved only the anterior

teeth. Of the sixty-four cases, in forty-eight, or 75 per cent, it was in the incisal region only and in eleven, or 16 per cent, between the incisors and cuspids. In only five, or 8 per cent, of the cases did the space extend backward between the buccal segments, none farther than the premolars.

Class II presented a far worse picture. Fifty-four per cent of cases in this class were in the incisal region only, 30 per cent involved the cuspids also, and 16 per cent were extensive. In one instance the space extended to the second permanent molars. The open-bite in Class III was very different in character, being irregular in pattern and location. The favored location seemed to be between the buccal segments of the arches only, but in one case it involved all teeth back to the first molars. In another the opposite was true, the space widest between the second permanent molars extending forward to the central incisors. This unusual case is shown in Fig. 7.

The next four columns present very significant data as in them are tabulated the malpositions of the teeth in the open-bite areas. Only the malpositions that might contribute to the formation of the open-bite were considered.

It is noted that in all of the 115 cases there was characteristic abnormality of the maxillary occlusal plane. In most instances this was so evidently infraclusion of the maxillary teeth of the open-bite region that it could not be mistaken. In the others it can be stated that these teeth were always relatively higher than normal in relation to the occluding teeth of the maxillary arch. *Whatever this abnormality may be termed, the very significant points about it are first, that it was a constant feature of all cases and second, that it was responsible for all of the space between the arches in most instances and for practically all of it in the remainder.*

Abnormality of the mandibular occlusal plane was much less frequent. When it occurred at all, it was always minor and usually consisted of slight infraclusion of the anterior teeth. However, the feature assumes etiologic significance when explanation must be made as to why this infraclusion of the mandibular incisors occurred in 33 per cent in Class I, only 7 per cent in Class II, and in no cases in Class III.

The column entitled "Maxillary Incisor Labial Tipping" also holds some very pertinent data. This malposition of these teeth contributes materially to the height of the space between the arches and thus is a cofactor of open-bite in many cases. Logical reasons must be given as to why this malposition occurred and also why it occurred in 72 per cent of Class I cases, fell off to 52 per cent in Class II, and was absent in Class III. As seen, labial tipping of the mandibular incisors was totally absent. This fact is of importance in determining the etiology as it further emphasizes the fact that the effects of the cause of open-bite are always seen to a marked extent on the maxillary teeth of the area but to a minor extent, if at all, on those of the mandible.

The most important data found in this tabulation seem to be the following:

1. Open-bite occurred with comparative frequency in all three general types of malocclusion and with many patterns of jaw development.
2. The mesiodistal relationship of the arches apparently influenced:
   (a) The tendency toward formation of open-bite. This tendency was pronounced in Class II, much less in Class III, and least in Class I.

(b) The location, extent, and pattern of open-bite. In Class I the space was in the incisal region only in three-fourths of cases. In Class II it tended much more to involve additional teeth. In Class III it was more irregular in these respects with the most liable location being the cuspid-premolar region.

(c) The tendency toward protrusion of maxillary incisors. This occurred in most Class I cases, was much less frequent in Class II and absent in Class III.

3. Actual or relative infraclusion of the maxillary teeth of the open-bite region was a marked characteristic of all cases in all classes. This vertical malocclusion of the maxillary teeth was responsible for all space between the arches in most cases and for nearly all of it in the remainder.

ANALYSIS AND EVALUATION OF THEORIES

This tabulation gives a fairly comprehensive picture of open-bite malocclusion in one practice. It is evident that among other things any theory as to the etiology of open-bite should be able to account logically and in detail for the production and perpetuation of the varying conditions of open-bite found in these 115 cases.

Seven well-defined theories as to etiology have been promulgated. Judging by the literature, most, if not all, of these theories were mentioned in some form even before the profession was founded. As they have been discussed at such length, it is presumed that they are so familiar to all well-versed orthodontists as to make it unnecessary to review them at this time. Therefore, they will be referred to by name only. Neither will there be any discussion of probable predisposing causes of the malgrowth of the jaws upon which some of these theories are founded.

It is fortunate for this study that, regardless of their differences, six of these theories assert purely mechanical *determining* principles to cause open-bite. The other one claims that hereditary or congenital lack of vertical growth in the body of the premaxillary bone is a cause. Aside from such hereditary or congenital lack of vertical bone growth, the only other possible determining causes must be mechanical forces that will either hold the teeth of the individual jaws in infraclusion or, acting through the mechanically movable jaw, prevent its complete closure. The object of this study is to try to find out whether the mechanical determining principles proclaimed by these theories can logically operate to cause open-bite of the teeth as we know it clinically. It is evident that if its determining principle is unsound, the theory itself is valueless and should be discarded. If it is sound, then professional study of its background is justifiable.

This places the testing of these theories directly in the special province of clinical orthodontics. As the result of common experience, numerous generally recognized clinical facts may be used effectively in conjunction with the foregoing data to evaluate their mechanical determining principles. In approaching the subject in this practical way the profession should not feel that it is stepping

down from some lofty scientific plane. Funk and Wagnalls' Dictionary states that "Science is knowledge gained and verified by exact observation and correct thinking."

The six theories divide themselves naturally into two groups according to the determining mechanical principles which they proclaim. The first group is comprised of the following:

(a) Posterior supraclusion, (b) Abnormally short ascending ramus, (c) Abnormally obtuse mandibular angle, and (d) Downward bending of the body of the mandible.

Posterior supraclusion might exist in either or both jaws, but the other three mean dystrophy of mandibular growth, differing in character. Although differing in these respects, they all proclaim the same mechanical determining principle. *This is the theoretical creation of an abnormal fulcrum in the posterior of the denture, thus preventing the teeth of the mandible anterior to the fulcrum from being brought upward into contact.* It seems unnecessary to illustrate the evident effect of such a principle. The resulting space between the arches would begin at the fulcrum and gradually widen, reaching its greatest width in the incisal region. Viewed laterally, its shape would be roughly that of a triangle. The vertical height of the teeth in the open-bite region, as related to their individual jaws, would not be affected.

Now, let us evaluate this principle. These theories state that this mechanical principle is sufficient to cause open-bite. It is only fair to evaluate it on that claim alone. The following are a few clinical facts that can be utilized in judgment:

Fact 1.—The long triangle with its apex in the posterior region is not the characteristic pattern of open-bite. Such extensive open-bite is exceptional. By the tabulation, it was seen that in 85 per cent of cases, open-bite occurred in the incisal-cuspid region only. It was found in all parts of the denture and might be long or short, wide or narrow, or varied in form. The posterior fulcrum theory cannot account for the many variations in location and pattern of open-bite as were seen in this group of cases. Neither does it explain how it could be unilateral or extend farther on one side than on the other. In one case it even involved the posterior teeth with the incisors in contact.

Fact 2.—None of these theories offers logical explanation as to why open-bite was found in otherwise normal dentures, why it occurred in all three classes of malocclusion and with many types of jaw morphology, or why the mesiodistal relationship influenced the tendency toward the existence of open-bite. Class II malocclusion is not usually found in association with the dystrophies of growth cited by these theories. Excessive overbite, the exact opposite of abnormal posterior fulcrum, is customarily found. Yet, apparently by far the greatest tendency toward formation of open-bite was in this class. In practically all Class III cases, the mandibular angle is obtuse. If this were a cause, most of the cases in this class should have open-bite. Clinically, it is seen that there was no unusual tendency to existence of open-bite in Class III.

Fact 3.—The passive principle of these theories cannot account for the variation in location, extent, and pattern according to the classes in which the open-bites were found; why it nearly always was in the anterior in Class I; why

in Class II it resembled that in Class I but tended to be more extensive; why in Class III it was very different from that in the first two classes.

Fact 4.—A vitally important finding was that the maxillary occlusal plane was invariably abnormal in a characteristic manner, viz., the teeth of the open-bite region were actually or relatively in infraclusion. This abnormality of the maxillary arch accounted for all of the space between the arches in most cases and for nearly all in the remainder. It was the thing that mainly comprised the open-bite. Obtuse angle, short ramus, and downward bending, being conditions of the mandible, cannot cause these malocclusions of the maxillary arch. If it were assumed that posterior supraclusion was responsible in some instances, it necessarily follows that this excessive vertical growth was always of the maxillary teeth as there was little or no abnormality of the mandibular plane. This, in turn, would raise the question as to why it would invariably be in the maxillary arch. Also, these theories cannot account for the clinical fact that abnormality of the mandibular occlusal plane, minor though it was, occurred with almost five times the percentage in Class I open-bite as in the Class II cases.

Fact 5.—Protrusion of the maxillary incisors was commonly seen in open-bite in Class I; it was less frequent in Class II and absent in Class I. The determining mechanical principle of these theories could not possibly have the ability to cause this condition, much less account for the variation in it according to the mesiodistal relationship.

Fact 6.—The plausibility of this mechanical principle is always asserted by showing it in connection with completely developed open-bite. That is not enough. To be valid, any theory must be able to account for every detail of the *production* of the abnormal condition. The arches do not form en masse, but tooth by tooth. Most open-bite found in maturity begins in childhood. This principle must be able to operate in both producing and maintaining open-bite through the very irregular unit production of the deciduous denture, the irregular unit loss of it and the equally irregular unit formation of the permanent denture. The following is only one of a number of pertinent questions as to its ability to operate successfully under these complex circumstances. Formation of the denture begins with the incisor teeth and proceeds irregularly backward. Thus, through the agency of the loose temporomandibular joint, the bite would be closed before the presumed abnormal fulcrum could be established. The later establishment of the fulcrum would have to be gradual as it would be caused by abnormal bone growth which is gradual. What would probably be the reaction during such a process? Would the teeth already in occlusion anterior to the developing fulcrum forego gradual vertical growth as the fulcrum slowly developed or would they be more likely to follow the normal process of elongation, thus keeping the bite closed, despite the dystrophy of growth in the posterior? Clinical experience indicates the latter course would be followed.

Fact 7.—This brings the evaluation to the most important biologic fact connected with open-bite. It is that, as parts of the exo-skeleton, the teeth are governed by laws different from and independent of the laws governing general growth. As Hunter first stated, "The alveolar process of both jaws should be regarded as belonging to the teeth rather than as part of the jaws." This bone

of adjustment grows with little regard to the form even of the bone on which it rests. The purpose of the growth process is vertical extension of the teeth. Lack of vertical extension of the teeth is the thing that constitutes open-bite. Once begun, this vertical extension continues until it is stopped by a force able to overcome the tendency. Even if growth is stopped for many years, it will resume if the obstruction is removed. The only exception to this prevailing tendency is the rare phenomenon—ankylosis. *It is doubtless part of Nature's wise plan to make vertical extension of the teeth independent of the laws of general jaw growth in order that it can bring about occlusal contact of the teeth despite inequalities in jaw growth such as cited by these theories.* Any cause of open-bite must be able to overcome this independent vertical extension before the teeth make contact, or be able to force them back in the opposite direction after they have made the required vertical extension to close the bite. It is inconceivable that an abnormal fulcrum in the posterior of the denture can have either of these effects.

The only clinical evidence that was found in support of these theories is that such dystrophies of growth as they cite sometimes may be found in association with open-bite. Fig. 2 shows the danger of assuming that this occasional association is positive proof that such malgrowth is a cause. In *A* the mandibular angle was extremely obtuse. If for some reason there had been open-bite, this malformation of the jaw might have been cited as the apparent cause. The fact that the lips could be closed normally, as seen, indicates that there was no abnormal posterior fulcrum. In *B* the models show that the bite was closed. In *C* a very different situation is seen to exist. The photograph plainly indicates a curve in the body of the mandible. Closure of the lips required much effort. Nevertheless, the models, *D*, show that there was no open-bite despite these apparently plausible reasons to suspect it.

The belief has long persisted that dystrophy of growth of the mandible holds some mysterious power not only to cause open-bite but also to obviate successful treatment by reopening the space after it has been closed by orthodontic measures. Prior to this study, the author shared in this opinion. In view of the clinical evidence presented that belief is not tenable.

HEREDITARY OR CONGENITAL INFRACLUSION

In evaluating this theory, it can be stated, first, that little evidence has been presented to show that hereditary or congenital deficiency in vertical growth of the body of the premaxillary bone occurs to such extent as to cause wide open-bite; second, that the deciduous incisors which this would primarily affect, erupt months before any posterior teeth and the freely movable jaw would close the bite of these teeth despite any vertical deficiency in them; and third, that if such deficiency did exist, it would not affect materially the independent extension of the teeth as organs of the exo-skeleton.

The second group of theories includes (a) *thumb- and finger-sucking* and (b) *abnormal tongue habits.* These theories assert that mechanical forces are applied directly to the teeth of the open-bite region, thus preventing their normal growth. Being intimately familiar with the reactions of teeth to such

force, orthodontists should be able to give these theories the acid test. To be valid, they must account for every detail of the production and perpetuation of any type of open-bite.

THUMB- AND FINGER-SUCKING

There has been much dispute over the theory that thumb- and finger-sucking is the cause of open-bite in permanent dentures. The following clinical facts support the claim that it is an important originating cause of the abnormal condition:

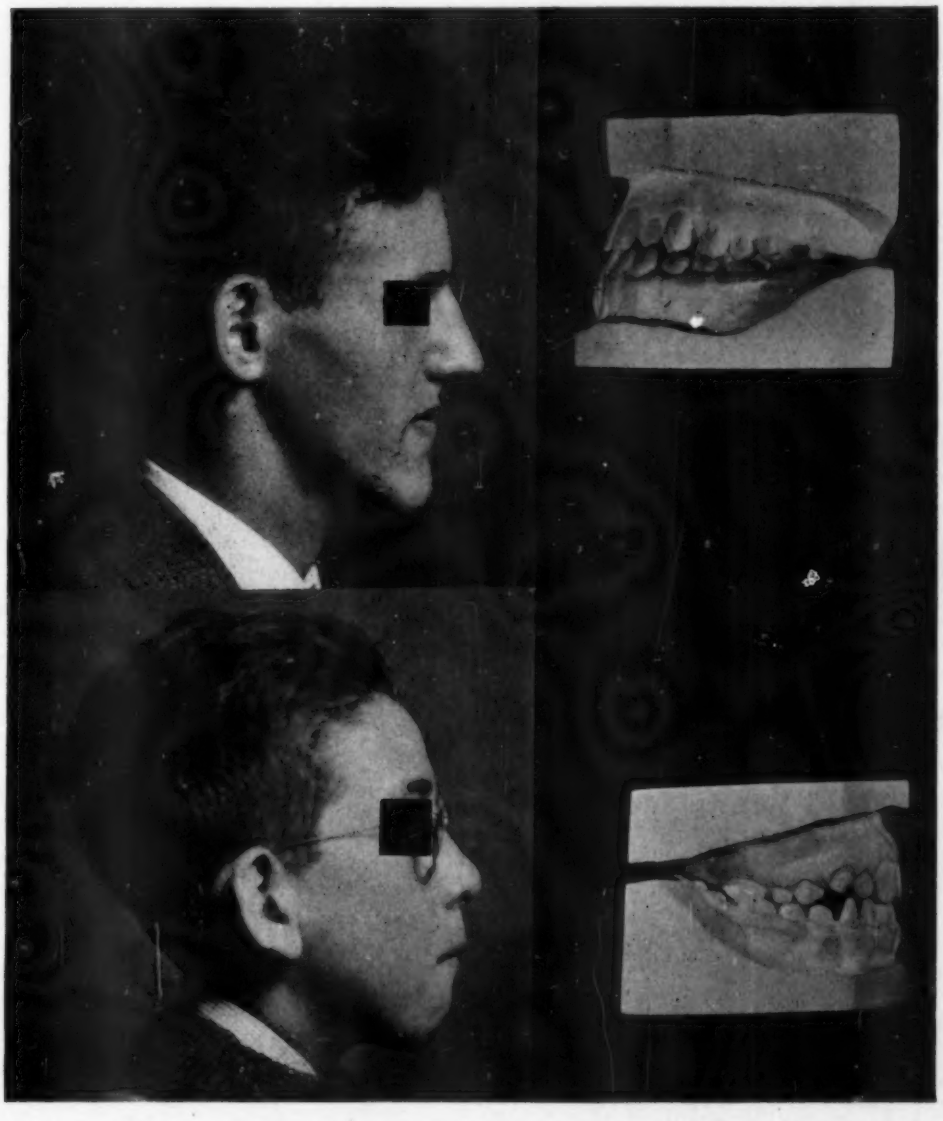

Fig. 2.—*A*. Patient with extreme obtuseness of the mandibular angle and great disparity in the relative lengths of the ramus and body of the mandible.
B. Model of the teeth showing no anterior open-bite resulted.
C. Patient showing marked downward bending of the body of the mandible.
D. Models of the teeth show that the mandibular malgrowth did not cause open-bite.

1. It is a very prevalent habit in childhood when most adult open-bite begins. It usually starts soon after birth, continues in many instances during de-

ciduous dentition and often persists as a lessened and secret practice during the formation of most of the permanent denture.

2. The site of the habit is in the anterior region where 85 per cent of open-bite is found. When two or more fingers are used, spaces extending to the molars may be seen.

3. The forces of thumb-sucking are usually upward and forward against the maxillary anterior teeth, with little downward pressure on the mandibular ones. The evident results of such forces correspond to the frequent infraclusion and protrusion of the maxillary incisors and the minor infraclusion of those of the mandible in open-bite cases.

4. In a previous study of active thumb-sucking cases, the author found 80 per cent had open-bite. When the habit was overcome, the teeth of the area were either completely corrected automatically or showed marked improvement.

5. In the same study, an unusually large percentage of Class II, Division 1, subdivision cases were found. This condition was directly related to a particular method of practicing the habit. In this tabulation of open-bite, a similar high percentage of this type of malocclusion was seen.

6. Very often open-bite cases in permanent dentures present early histories of thumb-sucking, either given by the patients or which can be confirmed by clinical observation. The relatively greater protrusion and infraclusion of right or left incisors usually correspond with which thumb was used and the method of the previously existing habit.

7. Thumb-sucking through originating spaces between the arches encourages abnormal tongue action. Even if the habit ceases before the deciduous incisors are lost, this abnormality of the tongue occasionally continues. The transition from the deciduous to the permanent incisors provides an opportunity for the tongue action to become normal. If the thumb habit persists beyond this period, the abnormal tongue action is very liable to be permanently established.

Three of the men answering the questionnaire expressed the opinion that the habit causes supraclusion of the buccal teeth through holding the jaws open. Thus far, clinical evidence has failed to prove or disprove this belief.

With all of these clinical facts in support and with no evidence to prove that thumb- and finger-sucking cannot produce open-bite, the habit must be considered an important *originating* cause. It cannot qualify as a *perpetuating* cause in many cases as the habit usually ceases in childhood.

ABNORMALITY OF THE TONGUE

The last theory to be discussed holds that abnormality of the tongue is both an originating and a perpetuating cause. In analyzing and evaluating this theory the following clinical facts may be used:

1. It cannot be gainsaid that the tongue has the mechanical ability to cause open-bite. Extremely facile, ideally located in relation to the arches, it is capable of entering and influencing all spaces between the arches of any length, width, pattern or location.

2. As the tongue is independent in action it can exert either normal or abnormal forces on the teeth in any type of occlusion or jaw morphology.

3. It is well known that in some instances the tongue is abnormally large. Such tongues either function normally within the arches and cause excessive expansion or find room by resting and functioning between the arches. In these latter cases, the arches are always deficient in lateral development. Such abnormal tongue size and habit is commonly found in the extensive open-bite cases in whatever class they may be found. Orthodontic attention has been given mainly to excessive width and thickness of the tongue because abnormality in these dimensions is easily discernible. Excessive length occurs, also. Clinically it is found that when such a condition exists, the prognosis of anterior open-bite is bad.

4. The main abnormality of the tongue, as it may cause open-bite, is in its action during deglutition. In this function only is this action continuous, uniform, and forceful as is necessary to prevent the independent vertical growth of the teeth. Clinically, it is seen that abnormality of tongue action in this function invariably accompanies open-bite. Whether such abnormality of the tongue is congenital, is acquired in early infancy, or consists of an adaptation of the tongue to spaces formed between the arches by some other agency has not been determined.

5. The characteristic malpositions of the teeth in the open-bite region are logically related to the forces of the tongue during deglutition. These forces are mainly upward and forward and the greatest disturbance is invariably seen in the maxillary arch. The great proportion of open-bite is in the anterior where the tongue is most active and where it must find a base to support its backward wave of muscular action during this function. The height of the space in extensive cases should usually be found greatest in the anterior and gradually reduce toward the posterior as the upward forces of the tongue surfaces contacting the teeth diminish gradually from before backward.

6. The tongue is attached to the mandible and governed by the muscles of that area but in swallowing it must make contact with the palate and teeth of the maxillary arch. During the act the condyles are back in their fossae. Thus, if the mesiodistal relationship of the arches is abnormal, the tongue in adjustment to unnatural conditions must necessarily become abnormal in its actions and forces. As the mesiodistal relation is normal in Class I, the tongue action should be more constantly normal. Therefore, it is logical that there should be the least tendency toward formation of open-bite in Class I and the greatest tendency in Class II in which the tongue is compelled to make its greatest adjustment to permit efficient swallowing. In Class III, the tongue is carried forward with the jaw and while its actions are altered, they are not of such character as to promote open-bite. This, again, is in accord with clinical observation that there is no special tendency toward open-bite in this class.

7. When the mesiodistal relationship is normal, the tongue is held during deglutition in the palate with its tip forcing forward and upward against the maxillary incisor teeth. Thus, in Class I open-bite, the space in most cases should be anterior only. It is logical to expect a high percentage of maxillary protrusion with little effect upon the mandibular incisors. In distoclusion the tip of the tongue also contacts the lingual of the maxillary incisors but must extend itself greater to accomplish it. The body of the tongue is held lower in the month and

has more lateral force. In the tabulation of this class, it was seen that there was less maxillary protrusion and greater tendency for the open-bite to extend posteriorly. In Class III the tip of the tongue is held under the incisal edges of the maxillary incisors, and there is an exaggerated lateral thrust of the tongue itself. Consequently there should be no maxillary protrusion and greatest tendency toward simple buccal open-bite.

8. The most convincing proof of all that abnormality of the tongue is in all cases the main perpetuating factor of open-bite is the reactions of the teeth of the area to various methods of orthodontic treatment. Figs. 3 to 8 presenting such clinical evidence will be discussed briefly. As experienced orthodontists you will be able to interpret readily what is seen in terms of etiology.

Fig. 3 illustrates the case of a girl, aged 11, which was treated by the following method some years ago. It gave more evidence than any the author has seen of having posterior supraclusion or some other abnormal condition in that region that seemed to prevent normal closure of the jaws. It will be noted that only the second deciduous and the permanent molars occluded. Cast crowns with previously calculated thickness in their occlusal portions were installed on the mandibular first permanent molars, as seen, with the purpose of driving these posterior teeth down by the force of mastication. Depression readily took place in these teeth and the maxillary molars. When the deciduous molars were again in contact as the result of this depression, they were extracted and the crowns removed from the permanent molars. This allowed the anterior teeth to come into contact immediately and successful reduction of the open-bite seemed to have been accomplished. However, in a short time the open-bite was the same as before. I leave you to judge whether the molars again elongated against the force of mastication which they alone sustained; whether dystrophy of posterior growth suddenly became active again and created a new fulcrum; or whether the tongue again opened the space. It may be stated that the open-bite was later permanently corrected by generous expansion of the arches, correction of the tongue habit and closure of the bite with labial appliances.

Fig. 3.—A method of depressing the molars by the use of gold caps with thick occlusal portions. (Leonard.)

Fig. 4 shows the case of a boy, aged 10. Top row: *A* shows the original condition with overexpansion of the arches. There was a broad tongue the end of which rested habitually between the anterior of the arches. *B* presents the condi-

tion six months after use of a palatal bar with downward projecting spurs to break up the habit. Progress was halted at this stage as the tongue succeeded in thrusting under the spurs but was resumed after an additional lingual bar was attached to the mandibular cuspids to make such entry of the tongue painful. *C* shows the case eighteen months after treatment was begun.

Fig. 4, bottom row, *A*, *B*, and *C* present side views of the same case.

Fig. 4.—Front and side views of an open-bite case, showing stages of normal vertical growth through orthodontic correction only of the abnormal tongue action.

Fig. 5 illustrates a young patient with potentialities of a very complex Class I open-bite in the permanent denture. The open-bite was originated by finger-sucking. While expansion of the maxillary denture was being accomplished, the maxillary permanent incisors erupted but stopped growing, thus forming the same type of open-bite. A palatal bar with spurs was used to correct both the finger and tongue habits. No retaining appliance was employed in the case. The bottom row shows the case ten years after completion of treatment.

Fig. 6 illustrates an extensive open-bite in a child, 5 years of age. The space in the anterior was as wide as is usually found in fully developed permanent dentures, while the arches were abnormally narrow. Thumb-sucking still persisted and there was a large and very active tongue. The thumb habit was corrected first with the result shown in *A*. After the permanent incisors were erupted and the bite was about the same in extent, treatment to enlarge the arches greatly was begun and carried on until the second permanent molars were in place. Any infraclusion was overcome by use of labial appliances, in conjunction with mechanical obstruction to abnormal tongue action during deglutition. The accompanying models, *B*, present the results.

Fig. 7 presents the most unusual and the most extensive open-bite that the author has seen. Only the central incisors were in contact. As noted, it was in Class III with impaction of the right maxillary cuspid. This case holds much food for thought in relation to the etiology of open-bite. It was an instance of prognathism, with attendant dystrophy of mandibular growth but instead of posterior fulcrum, there was infraclusion of both arches, increasing pro-

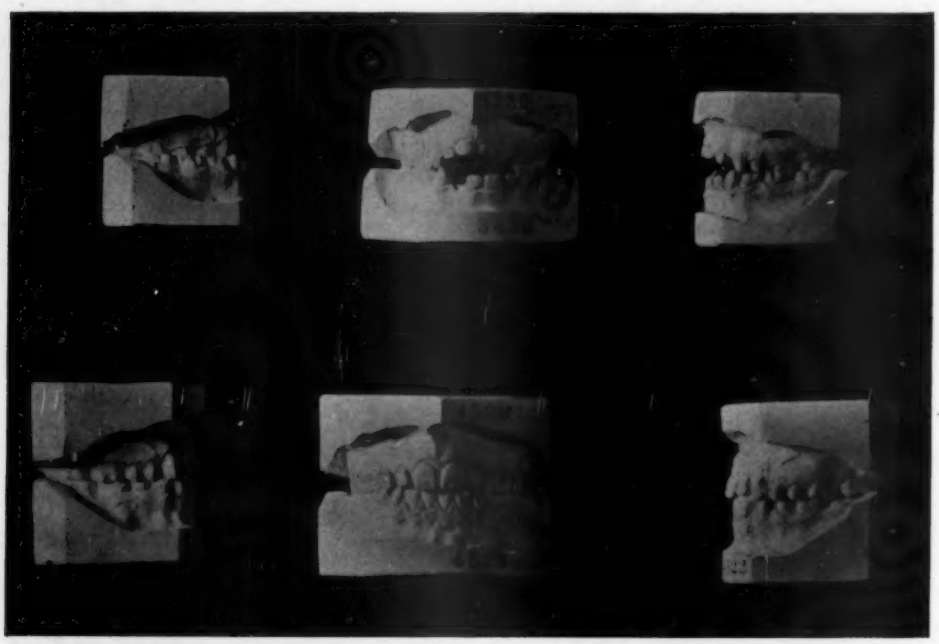

Fig. 5.—Top row, a complicated open-bite case caused by sucking the middle finger. Bottom row, normal conditions ten years after completion of treatment.

Fig. 6.—A case of extensive open-bite in a child, five years of age. Lower row shows progress of vertical growth as the result of (1) correction of the abnormal thumb and tongue habits and (2) wide expansion of the arches to provide tongue space.

gressively from incisors to second molars. As seen, the arches were normal in width. The only logical cause was the tongue, which was abnormally broad, especially in the posterior region. It rested between the arches, as could be seen by the depressions in it made by the teeth of both sides. The patient complained of its frequent soreness from being bruised during mastication. Treatment consisted of excessive expansion of the arches in the regions indicated and making space for the impacted cuspid, followed by closing of the bite by labial appliances with the use of intermaxillary force.

Fig. 7.—A very unusual open-bite case in which only the central incisors occluded. Tongue was abnormally wide in the posterior region.

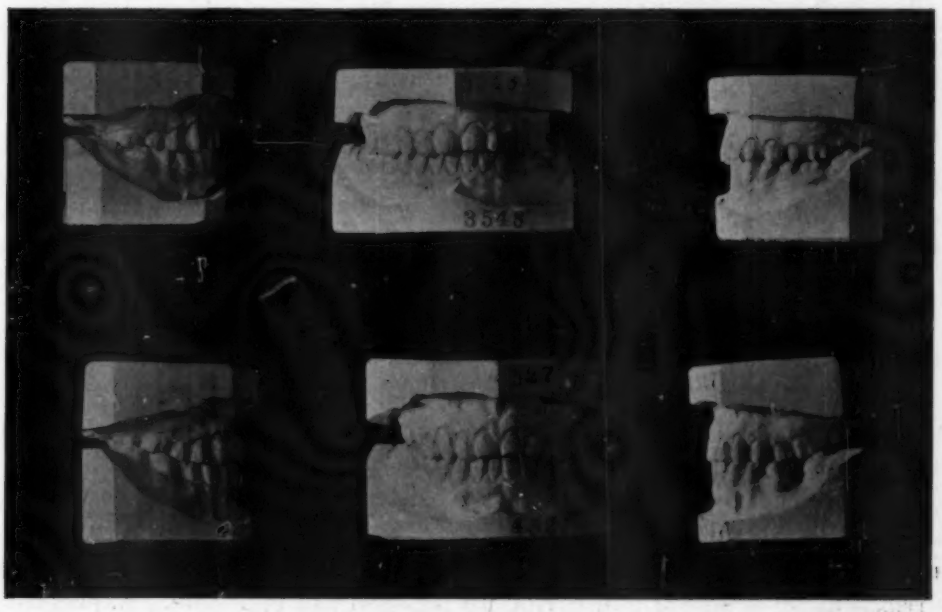

Fig. 8.—Top row shows correction of case in Fig. 7 through wide expansion of the arches and bringing the teeth into occlusion with intermaxillary force.
Bottom row, models of teeth fifteen years after treatment.

Fig. 8, top row shows the case at completion of treatment.

Fig. 8, bottom row shows it fifteen years later. As can be seen, it reverted partially toward Class III but the bite remained closed, apparently because the broad tongue had room to function normally inside the abnormally wide arches.

In summary of this evaluation of all theories, it can be stated that:

1. No evidence was found that posterior supraclusion, obtuse mandibular angle, short ramus, or downward bending of the mandible can cause open-bite, per se. This is because their mechanical determining principles are compen-

sated for by the free vertical swing of the mandible from a very loose joint and the independent vertical growth of the teeth. Nevertheless, dystrophy of facial growth apparently influences the formation and character of open-bite inasmuch as it changes the mesiodistal relationship of the arches and thus alters the forces of the tongue.

2. Indisputable evidence was found that thumb- and finger-sucking is an important originating cause of open-bite. The habit is often continued while the permanent denture is being formed. The spaces it makes between the arches compel abnormal action of the tongue.

3. The theory that abnormality of the tongue is the main originating cause and usually the sole perpetuating cause stood every test that was applied to it. The more the physiology of this organ was studied in connection with the clinical data of open-bite, the more logical this appeared. Abnormal size and form when associated with anomolous action seems to be the cause of extensive open-bite in all classes. Abnormal action in deglutition apparently is the originating cause in an undetermined number of minor cases but a perpetuating factor in all.

TREATMENT

The foregoing study of theories substantiates Angle's belief that overcoming abnormality of the tongue is the only real problem in treatment of open-bite. As he stated, placing the malposed teeth in occlusion is the easiest of tooth movements to perform. However, this fact does not make the orthodontist's task easy nor prognosis necessarily good. The reasons for the high percentage of failure in permanent correction of open-bite seem very clear. They are, first, because the orthodontist has to correct permanently the continual, involuntary malfunction of a very complex muscular organ although it is usually associated with various malformations of the jaws which promote the malfunction. Second, because in treatment of open-bite he does not have benefit of his greatest ally in retention, viz., the force of the occlusal inclined planes. When he does succeed, it is because he has one very valuable ally. This is the continuing vertical growth tendency of teeth. It is obvious that successful treatment must be founded upon intelligent observance of these biologic conditions.

Thus far, nearly all treatment has consisted of closing the space with active labial appliances and hoping for the best. That this method has been successful in many cases cannot be disputed. That it has failed so much more frequently is the reason there is now talk of giving up treatment of open-bite. Expectation of permanent results by this method presumes that the tongue will automatically correct its abnormal action after the space is closed. Therefore, the degree of success by this plan must depend upon at least four things: (1) Securing and maintaining normal environment of the tongue. This means in addition to bringing the vertically malposed teeth into correct overlap, the correction of abnormal mesiodistal relationship and particularly the establishment of arches of sufficient size and form to accommodate the tongue. Such ideal conditions are not always possible. Open-bite is usually associated with other malocclusions, the normal correction and permanent retention of which are often doubtful. (2) Bringing about the correct amount of vertical extension of the proper teeth of the open-bite region. (3) Upon the length of time the habits have existed

before treatment is begun. As a rule the longer they exist the more fixed they become. (4) The individual tendency toward habit continuance and resumption. The cause of this individual variation is little understond but it is recognized by all who attempt to treat habits of any kind.

This analysis indicates that in this plan of treatment of the open-bite feature of cases, the following points should be borne in mind:

1. The maxillary teeth of the open-bite region should receive all of the vertical movement in most cases and nearly all in the remainder.

2. If a labial appliance is used on the maxillary arch alone, the posterior anchorage should be immovable.

3. When intermaxillary force is employed, the posterior anchorage of the maxillary labial appliance should be freely pivotal, the mandibular teeth providing the real anchorage.

4. The mandibular incisors should not be attached to the appliance unless clearly indicated to be in infraclusion. As this infraclusion is always slight, attachment to these teeth should not be made until the last stage of the vertical tooth movement. These teeth yield easily and may be readily carried into supraclusion. This gives the deceptive appearance of proper over-bite. After retention, however, these teeth quickly regain their normal vertical positions and thus leave a space which compels continuance of the abnormal tongue habit.

5. When the tongue is abnormally broad, overexpansion of the arches as indicated is essential to success.

6. Treatment usually should begin when the denture is mixed, but in many cases even before that stage of development. Postponement of the treatment of patients having open-bite features until the permanent teeth are erupted predisposes to frequent failure in permanent correction of the open-bite.

Open-bite is largely an independent phase of general malocclusion as shown by the fact that it occurs with any type of maldevelopment of the jaws or malocclusion of the teeth. It seems logical that it should be treated as such. The slogan of orthodontics has long been, "Find the cause, remove it and the battle is won." Yet here is a definitely recognizable mechanical cause close at hand and the profession has given scant attention to its direct removal. Even the simple palatal bar to correct abnormal tongue action has been used sparingly. After fifty years of use of the labial appliance method, the prognosis is still generally believed to be very bad. Other methods, designed to attack the cause directly, when used alone or in conjunction with the time-honored method, seem to offer the only additional hope. Little thought has been given to the development of techniques for this purpose. With the ingenuity that has so increased the efficiency of general orthodontic appliances, the profession should be able to devise tongue habit appliances far more reliable than the pioneer palatal bar. Development of systematic exercises to correct abnormal actions of the tongue after its environment has become normal and the more general use of these measures doubtless would contribute much to greater success in permanent retention. Thus far, such valuable means have been conscientiously employed by but a few men. However, despite technical improvements, one must remember that habit correction will often be a long and tedious job. Human habits simply cannot be cured with mathematical regularity.

It is well to keep in mind, in this connection, that preventive treatment is the best treatment. The theory that thumb- and finger-sucking is an important etiologic factor in open-bite withstands clinical evaluation. Thus far, orthodontists have done little about correction of this very prevalent habit.

PROGNOSIS

It is stated that, in general, the prognosis of open-bite is bad. How bad the percentages are or how they compare with those of other malocclusions, no one knows. However, several very well-known and highly regarded orthodontists have told the author that they are materially increasing their former averages. Without exception these men have been employing measures to correct the abnormal habits directly, in addition to using the time-honored method. Certainly, adopting the defeatist attitude of settling up open-bite as another supposed orthodontic limitation will do no good. If this study means anything, it is that problems of open-bite are mostly clinical. That seems to leave the solution squarely in the office of the conscientious, practical orthodontists.

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CRIPPLED CHILDREN?

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DURING the past twelve years it has been the writer's privilege to be connected with a hospital for the treatment of crippled children, namely the Pennsylvania State Hospital for Crippled Children situated at Elizabethtown, Pa. During that period it has also been the writer's privilege to be associated with orthopedists both in a personal and professional capacity as connected with the services rendered in the hospital.

As time goes on we are more and more frequently impressed with the realization that although orthopedics and orthodontics are so closely related, yet in the practical application of treatment of the deformities, orthodontics and orthopedics are completely severed. It seems unusually singular that although we have such a great common meeting ground in Wolff's Law, nevertheless one is forced to face the question with alarming frequency, "Why cannot the treatment of facial deformities be carried out as any other branch of orthopedics?" One is almost forced to treat as doubtful the statement that orthodontics is really dentofacial orthopedics. As an example let me cite a hypothetical case.

Mrs. B. has been so unfortunate as to have a boy with a clubfoot or scoliosis or congenital hip or any other deformity and having no funds for private medical or surgical treatment immediately contacts her local Crippled Children's Society. Through that organization her son is referred to and finally admitted to the Crippled Children's Hospital where he is given adequate orthopedic care. Her neighbor, Mrs. S., is also unfortunate. Her boy, however, has a facial deformity either because of some congenital condition such as cleft palate, with or without a speech defect, or a typical posterior or anterior occlusion producing a facial deformity. Now Mrs. S. immediately thinks of her neighbor's experience and since they are a family of similar financial status, presents herself with her boy to the Crippled Children's Hospital. She believes that they are interested in bone deformities and since they took such good care of her neighbor's boy, with no question of doubt knows that something can and will be done for her boy. Much to her bewilderment she learns that they do not treat cases such as this and in her disappointment reasons, "They must not believe my son has a deformity, or at least they do not recognize it as such, otherwise why won't they treat him?" And continues on with, "If my boy had both a crippled foot and a facial deformity and I was allowed the choice of having just one of them corrected, I would have the face treated first."

We assume that it is the intention of the State that every crippled child should be made self-supporting and whole. If he is lame, he is made to walk so that he can go out in the world and become a useful, self-supporting citizen. But

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how singular it is that a child who has a facial deformity, either with or without a speech defect, according to the standards now established, is relatively so unimportant—yet we try to prepare one child to walk up to ask for a job, while the other, who can walk there but cannot ask for it when he gets there, is neglected.

The writer has made it a point to peruse very carefully many orthopedic textbooks and journals. We have noticed that much space is devoted to the cause and treatment of every known deformity except those which appear above the neck. In no instance is there found any reference to any malformation of the jaws so that one can almost ask the question, "When is a crippled child not a cripple?" and have the answer immediately, "When he has a deformity above the neck."

It appears we are missing a great opportunity to be unable to exchange ideas for undoubtedly the orthopedist and orthodontist have many similar problems. A more familiar understanding between the two groups would certainly prove that orthodontics is really dentofacial orthopedics. It is fitting and proper that the orthopedist should appear on an orthodontic program and reciprocally it is equally important that the orthodontist appear on the orthopedic one. Such an exchange could not help but be extremely beneficial to both groups.

We in our specialty of orthodontics speak so much of myofunctional therapy, which is truly a part of all orthopedic treatment, even to the point of questioning its necessity and whether or not it should be a definite part of our treatment. How foolish to even discuss it in such a manner. Its necessity should be definitely understood and established provided we consider our problems as orthopedic ones. The general orthopedist without a physiotherapist is as handicapped as an orthodontist without his appliances. They belong together; one follows the other; they complement each other. We need consider no question; we face a fact.

We hear the statement made every so often by the orthodontist that orthodontics could not be handled in an institution or clinic; but the logic of such conclusions is false. The argument is advanced that it is too involved; too expensive to produce; the course of treatment is too long; but that reasoning cannot be followed for the truth of the matter is that such is the problem of all orthopedics.

To help a child develop into a normal adult the orthopedist does not hesitate to hospitalize his patient for one year or as many years as is necessary to bring the case to the desired completion and his whole institution is built with that in mind. The orthopedist is surrounded by a corps of assistants which makes it possible for him to handle patients where and how he pleases. In an orthopedic institution we find the head of it the orthodopedic surgeon, but along with him we find the physiotherapist, the consulting medical staff including pediatricians, the brace-makers, the dietitian, the nursing staff and the school-teachers, all working together to help the crippled child. But when a dental staff is established in the same institution, too often they seem to think that a small consulting staff and probably one full-time dental interne, who knows little enough of our problems, is amply sufficient. What a paradox! What are we to do if 65 per cent of the children of civilized countries are destined to ir-

regularities of the teeth, some with aggravated facial deformities? We are indeed facing as great an orthopedic problem as ever was presented generally.

To help a facial cripple properly and serve him scientifically requires just as much of a well-rounded dental staff as is required by the orthopedist. When we consider the need of the worst of these cases, the cleft palate patient, we face such a severe deformity and extreme condition that the task is tremendous; and a successful result can be accomplished but *only* when given the proper opportunity and assistance. An adequate dental staff should consist, first of all, of a qualified oral surgeon; a dentist who will do the best dentistry possible for these patients; a trained orthodontist; a prosthodontist especially taught for this department; the speech correctionist and finally the psychologist. This group working together is just as important as those before mentioned in the general orthopedic department and is essential to the smooth functioning of successful treatment.

Let us now consider the problem of speech which is one of our special senses. We refer to those speech problems which are caused by malformation of the jaws and irregularities of the teeth. Does it not seem strange that every hospital in the country has a well-equipped and well-staffed department for the treatment of eyes, nose and throat, while the problem of speech, also a special sense, is handed for solution to the speech correctionist in the public schools *before* anything is done to correct the anatomic background which is more often than not the contributing factor? Then conceding that the speech correctionist does find the causative factors of this condition, we wonder where, most generally speaking, these patients can be sent except to men in private practice who cannot afford the time or money required to accept the cases unassisted. Speech is extremely pertinent to dentistry. Why it has not been stressed more is beyond understanding. We have been taught that the teeth and their associated structures are primarily organs of mastication, but the secondary function is associated with speech and esthetics. We have stressed mastication and esthetics but have ignored the problem of speech.

In the field of cleft palate and cleft palate speech most physicians and dentists seem to feel that surgery is the answer, the ultimate. When the reverse is actually true, it is the beginning, the commencement. And the only way of solving these problems satisfactorily and scientifically is to improve our dental setup in all these various institutions and communities. It is a responsibility which belongs to dentistry. We in the profession can fill our true place adequately, as a branch of the healing arts, only when we recognize and accept these as our own individual problems. It is so necessary that we have in the various institutions a capable and efficient dental department and we cannot unduly stress the importance of the *whole* group, the oral surgeon, the orthodontist, the dentist, the prosthodontist, the speech correctionist, and the psychologist.

We are fully cognizant of the fact that there are some few institutions which are already attempting this work, but these sporadic efforts, although extremely commendable, are almost lilliputian when we consider the great number still left without care. There is a crying need for action when we consider there are always 250,000 persons in the United States alone suffering from cleft palate and resultant deformities.

These problems form a challenge to orthodontics and a call to arms for all of dentistry. Are we willing or able to cope with the situation? We feel that the field for great service that is facing orthodontics grows tremendous. The medically controlled institutions must be made to understand and see our need and should give us all assistance. The time is not far distant when the laity will question more and more the lack of proper dental service. We constantly hear men state that dentistry is not recognized in the same light as medicine, but it will be only through organization and earnest cooperation that we will be able to place dentistry in the position we feel it should occupy.

This is not a plea for socialized treatment any more than we can call the present orthopedic setup socialized medicine. But it is a plea for a clear look into the future; to see to it that state funds and private funds set aside for the treatment of general deformities are also made available for those involving facial deformities; that eventually our facial cripples will get the same consideration and on the same basis.

Doctor Anderson of Yale University has said it is a well-known fact that the field of medicine and dentistry has never separated, but the physician and the dentist have. Unfortunately there are caught in the backwash of the separation, the dentofacial cripples, the one truly neglected group. We have learned and are learning that much can be done and the years ahead hold promise of greater accomplishment.

Finally, may we quote from Sir Thomas Lewis as published in *Research in Medicine* in 1939, "The First and Last Must Be Clinical:—Knowledge that is to be applied usefully to the health of mankind will almost always come by a series of steps, the first of which is the recognition of the human need, the last of which is the application of a test directly to the human problem. It is in the nature of things, however many steps may intervene, that the first and last must be clinical; as it is also in the nature of things that almost all important physiological discoveries that are immediately applicable to the treatment of disease have their original source in clinical observation. . . ."

THE RESPONSIBILITY DENTISTRY MUST ASSUME IN THE TREATMENT OF THE ORAL CRIPPLE

JOHN J. FITZ-GIBBON, F.A.C.D., HOLYOKE, MASS.

THE public has been educated to the great need of orthopedic treatment for the crippled child and has subscribed wholeheartedly to the various foundations established for their rehabilitation. In the case of the underprivileged, the period of time necessary, the expense entailed, and the prognosis apparently have little bearing on the service rendered. Treatment is available for all. Yet, the oral cripple, and in particular, the most seriously handicapped—the cleft palate cripple—receives but meager and unorganized assistance. Patients who can afford private care, as well as the less fortunate ones, suffer from lack of coordinated dental treatment in the general rehabilitation program. Who is responsible for this gross neglect?

What has dentistry, as a profession, done to emphasize the dental needs of the cleft palate patient? It is all too apparent that we, as dentists, have not cooperated with the medical profession, or among ourselves, in the care of these cases. In postsurgical failures, or mutilations, the patient is often referred back to the surgeon, when the correct treatment would be a properly designed appliance constructed with due consideration as to function and esthetics. There are many cases where a secondary surgical attempt is not indicated and certainly the conscientious surgeon, if he but knew the true value of proper dental care, would cooperate wholeheartedly and refer the case to the dental specialist, rather than attempt more surgery when the prognosis is unfavorable. How can the medical profession know the true value of the respective specialties of dentistry until the dentists realize their obligation and the need of cooperation among themselves?

The general practitioner is usually the first to be consulted when a patient with a palate deformity seeks dental service. He cannot make a proper diagnosis, or determine a prognosis, without a consultation; yet seldom is one suggested. Proper tooth repair, which is of great importance, is often neglected; no doubt because of the fact that the general practitioner of dentistry does not realize the vital necessity of tooth preservation for these patients. Many times a malocclusion, which an orthodontist would recognize sufficiently early for a comparatively simple correction, is overlooked until it has developed into a serious and complicated problem. Malocclusions are prevalent in postoperative cleft palate cases and should receive early orthodontic treatment.

If orthodontic intervention is to be carried through to a successful termination, the orthodontist must have a thorough knowledge of what can be accomplished advantageously by prosthesis, especially in the complicated case where a mutilation may be indicated. In adolescence, where, from a psychologic

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Fellow of the American Speech Correction Association.

or economic aspect, a speech appliance and speech correction may be of such immediate importance that prolonged orthodontic treatment is contraindicated, orthodontics must be supplemented by prosthodontics, in order to obtain a functional and esthetic result.

When I say the prosthodontist, I do not mean the general practitioner of dentistry. Orthodontics for the general practitioner may be a questionable procedure, but palate prosthesis is far more hazardous. The attempt of the practitioner, with but little skill and experience, to construct a speech appliance, results in disappointment for the operator and despair for the patient—often far more acute than it is realized. Cleft palate prosthesis is a highly specialized field. The palate prosthetist must be capable of judging the limitations of surgery, the value of good operative dentistry, the possibilities of orthodontic intervention, and the modifications of technique in constructing speech appliances. He must have a knowledge of speech pathology and, most important, he must know how to correlate all corrective methods for the best possible result.

Of course the speech correctionist also has a definite responsibility in this program. The cleft palate sufferer, in the majority of cases, develops an anxiety psychosis and the speech correctionist who attempts to help these patients must fully understand this personality. In the case where the patient wears a speech appliance, the speech correctionist must have a knowledge of its mechanism and the principles involved in its manipulation. The development of the intellectual aspects of speech and the correction of faulty tongue habits are difficult tasks which require the skill of an experienced speech psychologist.

The case of Dorcas D. vividly portrays the lack of cooperative care so often encountered and shows the result obtained when proper dental treatment was finally made available. Let me emphasize that in discussing this case and the service previously rendered Dorcas, I make no adverse criticism of any individual. There was honest effort on the part of all who tried to help this child. Time and expense were not spared, but proper dental treatment was excluded.

My first contact with this case was a request for consultation from the Division of Orthopedics of a State Department of Health. A survey disclosed an unfortunate girl (Figs. 1 and 2), 15 years of age, with a congenital cleft palate, type four, postoperative mutilation (Fig. 3). There was extreme loss of hard and soft palate structures; and the entire premaxillary process, including central and lateral incisors, had been excised. A Class III occlusal relation (Fig. 4), with all remaining maxillary teeth in linguoversion, resulted in a great loss of vertical dimension. The patient had a short postoperative lip and poor symmetry of the nose, which gave her a sullen facial expression and evidenced her mental and physical suffering. An examination of the teeth disclosed fourteen areas of caries and a pulp involvement in the left mandibular second molar. X-ray examination disclosed four unerupted third molars in malposition. A badly scarred arm (Fig. 5), resulting from attempted dermal grafts, added not only to her disfigurement, but to her mental distress as well (Fig. 6).

According to her previous case history, lip and palate surgery had been done in infancy; palate closure was but partially successful. A tonsillectomy was later recorded—apparently a radical dissection, as mutilation of the

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 1.—Full face view. Fig. 2.—Profile view. Fig. 3.—Intraoral view. Fig. 4.—Showing the occlusion of the patient.

Fig. 5.

Fig. 6.

Fig. 5.—Badly scarred forearm, the result of attempted dermal grafts to the palate. Fig. 6.—Evidence of mental depression.

posterior pillars was in evidence. Again, at the age of twelve, the patient was hospitalized as a physically handicapped child; and an attempt was made to improve upon her previous palate surgical result. Three operations were recorded. Two of them were attempted grafts from the left forearm to the palate. A period of five and a half months of hospitalization and the result—complete surgical failure!

Fig. 7.

Fig. 8.

Fig. 9.

Fig. 10.

Fig. 7.—Maxillary impression. Fig. 8.—Maxillary model. Fig. 9.—Occluding models. Fig. 10.—Cast shells on cuspid teeth.

Consider the time and money generously expended on this case—all futile insofar as helping the child was concerned. Yet, this same department of health makes the statement, to quote, "It has been our custom here to approve state aid to an amount not over $75.00 for mouth apparatus." Let us ponder this statement for a moment and briefly summarize the dental needs in the case: (1) extensive tooth repair; (2) a correction of the malocclusion; (3) minor oral surgery; (4) tooth preparation for, and the construction of, a properly designed speech appliance—all correlated for the best possible result in esthetics, oc-

clusion, function, and speech improvement. How much of this can be considered, to quote, "mouth apparatus"? It is all necessary dental care! We, as dentists, must realize this fact and educate the medical profession, and the public as well, to the value and the necessity of complete dental treatment for the successful rehabilitation of these patients.

Fig. 11.

Fig. 12.

Fig. 13.

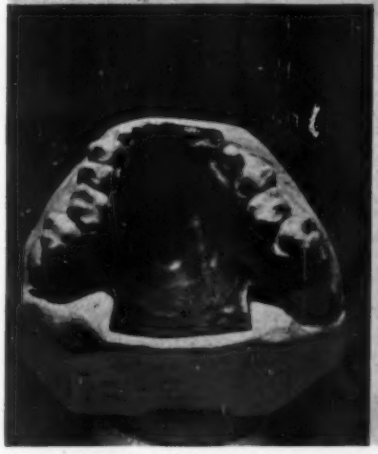

Fig. 14.

Fig. 11.—Maxillary model. All preliminary preparation has been completed. Fig. 12.—Master mold. Fig. 13.—Master mold corrected with base plate. Fig. 14.—Investment model with palatal plate, tailpiece, retentive bars, and onlays, waxed for spruing.

In reviewing this case of Dorcas D., technique is omitted, but sufficient steps will be shown to illustrate the essential routine. After complete visual and x-ray examination, impressions were taken for study models, the maxillary impression extending to the pharynx, in order to duplicate all structures involved (Figs. 7, 8, and 9). All teeth showing carious areas were then repaired and three of the unerupted third molars, together with the aforementioned second molar in which a pulp involvement had been disclosed, were extracted. The labial mucosa was adherent to the vomer, producing a tight sphincter as well as a short lip. This adhesion was freed by dissection and gave the necessary flexi-

bility and length to the lip. The models were then surveyed for design of restoration, with due consideration to function, occlusion, and esthetics. Had early and complete orthodontic treatment been available, the case would have been simplified and a complicated design unnecessary. Unfortunately, time would not now permit orthodontic treatment. Because of the position of the maxillary cuspids, it was necessary—for tooth preservation and lip contour—to prepare them for cast thimbles (Fig. 10).

Fig. 15.

Fig. 16.

Fig. 17.

Fig. 18.

Fig. 15.—Palatal view of rough casting (sprues still in position). Fig. 16.—Superior view of rough casting, showing stabilizing wings. Fig. 17.—First casting with wire attached for bulb impression. Fig. 18.—Bulb impression completed.

All work preliminary to the construction of the appliance having been completed (Fig. 11), a hydrocolloid impression was taken and a master mold made (Fig. 12), corrected with a baseplate technique (Fig. 13), and duplicated for the waxing of the palatal casting, tailpiece, and retentive bars. Because of the extremely short maxillomandibular relationship, the bite had to be opened—hence the case was designed with onlays (Fig. 14) and, because of the anterior occlusion, overlays were necessary. It was also necessary to design wings on the superior surface of the palatal casting to increase tissue-bearing areas, and to insure stability of the lateral maxillary segments. Upon the completion of this first casting (Figs. 15 and 16), the case was ready for the bulb impression. A

wire form was attached to the end of the tailpiece (Fig. 17), and to this a mass of carding wax was added; the palatal plate was inserted in the mouth and, by manipulation, the desired bulb contours were obtained (Fig. 18). A two-piece mold (Fig. 19) was made to preserve the relation of the tailpiece and this bulb impression (Fig. 20). A hollow replica of this bulb was then waxed, invested, cast, and soldered in position. Anterior teeth were set up, with due con-

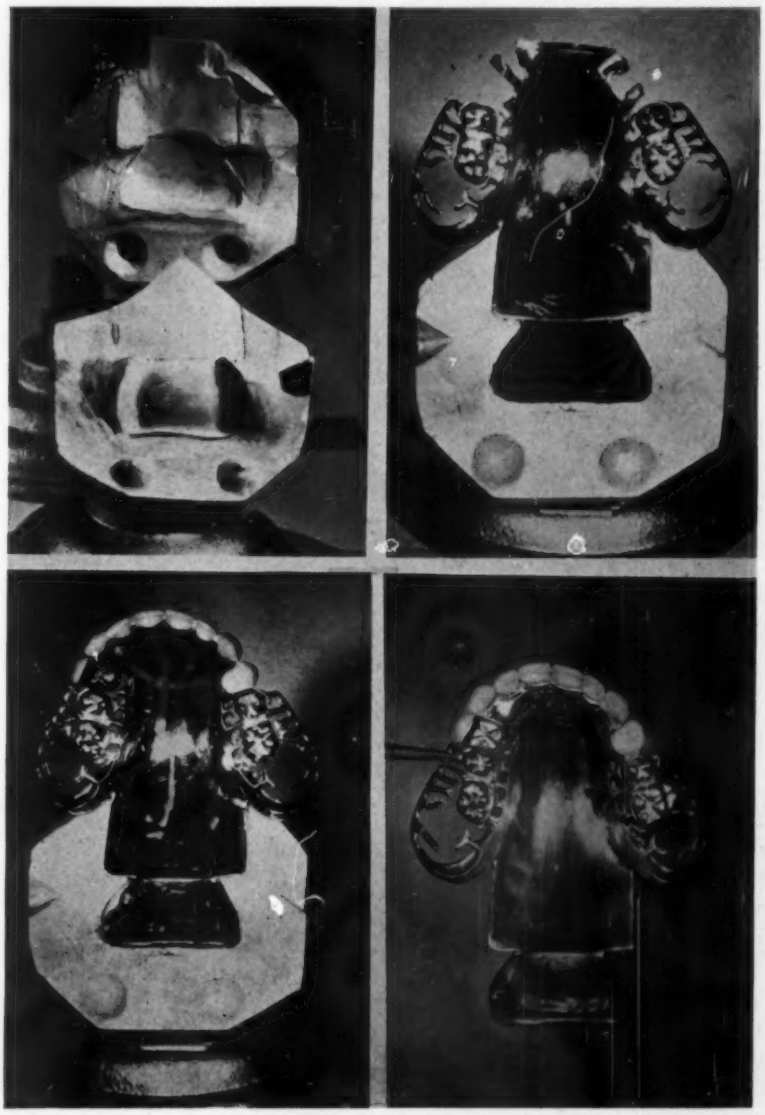

Fig. 19. Fig. 20.

Fig. 21. Fig. 22.

Fig. 19.—Two-piece mold of tailpiece and bulb impression. Fig. 20.—Relation of the palatal plate and bulb impression in mold. Fig. 21.—Cast bulb soldered in position and duplex waxed and sprued. Fig. 22.—Duplex attached to palatal casting with teeth set up.

sideration to all factors involved, and the case checked in the mouth. A duplex to cover tooth attachments and to give proper labial contour was then waxed in position, sprued (Fig. 21), cast, attached (Fig. 22), and the case cured and finished (Figs. 23, 24, 25, and 26). After the insertion of the appliance (Figs. 27 and 28), the patient was given preliminary instruction concerning mastication, speech manipulation, and the care of the appliance.

Fig. 23.

Fig. 24.

Fig. 25.

Fig. 26.

Fig. 23.—Anterior view of finished appliance. Fig. 24.—Lateral view of finished appliance. Note wings and onlays. Fig. 25.—Superior view of finished appliance (note wings). Fig. 26.—Model of appliance in position.

Fig. 27. Fig. 28.

Fig. 27.—Intraoral view of appliance in position. Fig. 28.—Occlusion.

The final result of this case (Figs. 29, 30, and 31), from a dental viewpoint, may be considered a satisfactory one. But, let us reflect for a moment upon the life of this child for the past fifteen years and how much easier it would have been for her had proper dental care been included in her early treatment. Tooth preservation would have been watched more closely. Proper orthodontic treatment would have improved her occlusion and appearance. Consultation would have brought out the fact that secondary surgery, which in this case was so unsatisfactory, was not necessary. The bulky appliance which she now must wear could have been of smaller and lighter design, and, most important, the child would have been spared years of acute misery.

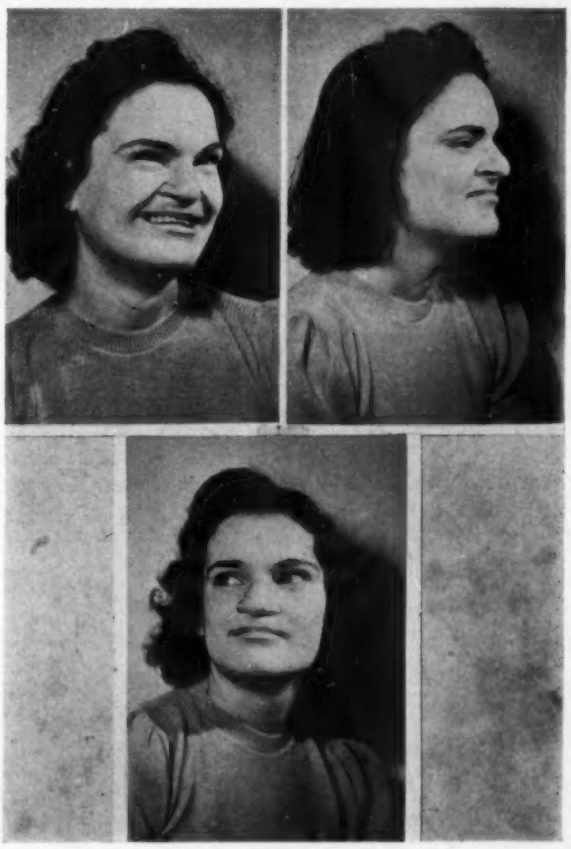

Fig. 29. Fig. 30.

Fig. 31.

Fig. 29.—Three-quarter view. Fig. 30.—Profile view. Fig. 31.—Full face view. (Note length and symmetry of lip and increased maxillomandibular relation.)

Four weeks of concentrated effort carried this case through all necessary dental procedures. This apparently hopeless oral cripple was transformed into a hopeful and happy young lady. To quote Dorcas (an excerpt from a speech recording made by the patient), "... I think I am the happiest girl in the world. All my life I have hoped and prayed that I could be helped to look and talk like other girls. ... I have wanted to do the things that other girls were doing, but because of my speech and appearance, I could not join in with them. Now I look in the mirror and think that I must have awakened from a bad dream. Just looking so different makes life seem worth while. ... I know that my speech

is still poor, for I have had my appliance only two weeks, but now that I know good speech is possible, I am going to work very hard until I can talk as others do.''

We all know only too well that the child suffering from a serious malocclusion, speech defect, or a cleft palate, is more handicapped in life than one with a deformed limb. These oral cripples cannot be rehabilitated without the aid of the specialists of our profession. Dentistry is of vital importance to these patients, and I reiterate, we as dentists must cooperate and assume our responsibility for their proper treatment. The medical profession and the public as well must be educated to the full importance of including, in all orthopedic programs, dentistry in all its coordinated phases. Then, and only then, will oral cripples receive the complete consideration and care they so much deserve.

56 Suffolk Street

ORTHODONTIC CASE REPORTS

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HEREWITH are presented three case reports selected because of some principles of treatment involved and accompanied by cephalometric records.

Fig. 1 is that of a young man, aged 22, who had just completed his sophomore year at Harvard Dental School. Appliances were inserted June 15, 1938, when the original models were made. Appliances were removed Sept. 1, 1938, about ten weeks later. At that time superior and inferior Hawley retainers were inserted.

The lower set of models were constructed March 4, 1941, just prior to this meeting by a fellow officer of the patient who is now in the dental corps of the U. S. A. These models were made about one year after he had discontinued wearing his Hawley arches (Fig. 2).

While perhaps this should be classified as Angle Class I, all the mandibular teeth, as well as the mandible itself, are anterior to normal. Fig. 3 is an anterior view of the same case.

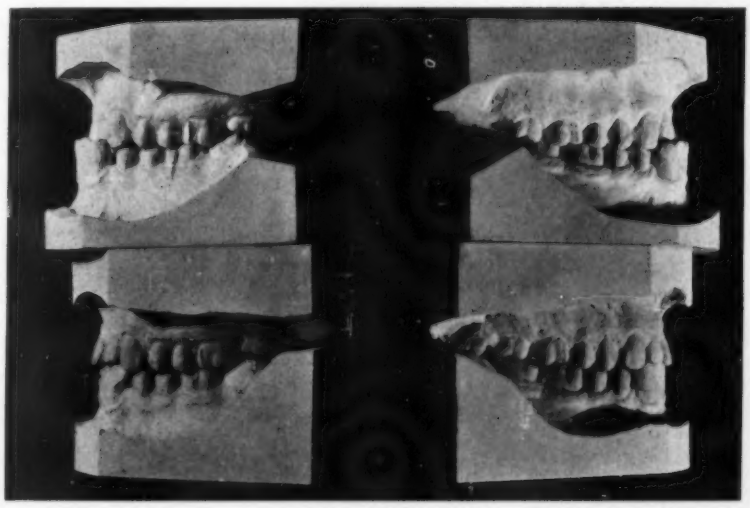

Fig. 1.

Fig. 2.

Fig. 1.—D. F., left. Young man aged 22, before treatment. Appliances inserted June 15, 1938. Appliances were removed Sept. 1, 1938, and Hawley retainers were inserted.

Fig. 2.—D. F., right. Casts of patient made March 4, 1941. Hawley retainers had been removed about one year.

Fig. 4 is a diagram of the appliances that were used. Bands with attachments having horizontal slots were placed on the maxillary and mandibular teeth as indicated. Molar bands with round .020 tubes were placed on the first permanent molars. Note on these first permanent molars cement blocks

Presented before the Fortieth Anniversary Meeting of the American Association of Orthodontists, May, 1941, New York City.

under contoured occlusal metal belts which serve to depress or lower the mandible. Round labial arches .020 in diameter were inserted in both upper and lower arches. Stops for coil springs were placed on the maxillary labial arch about 5 mm. anterior to the molar tubes to permit the elongation of that wire. Loops are placed in the mandibular arch wire anterior to the canines. These loops serve two purposes (1) to engage intermaxillary elastics and (2) to shorten the labial arch wire and exert pressure on the mandibular incisors.

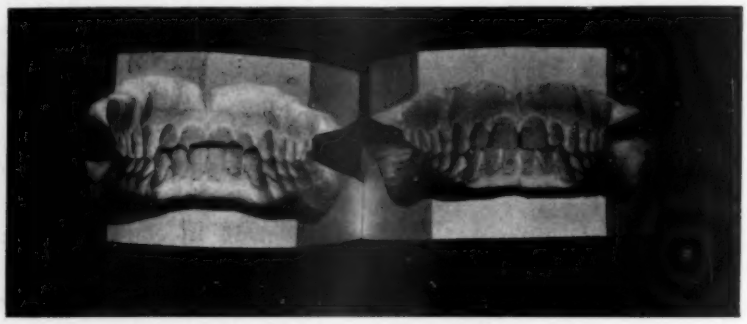

Fig. 3.—D. F. Anterior view of Figs. 1 and 2.

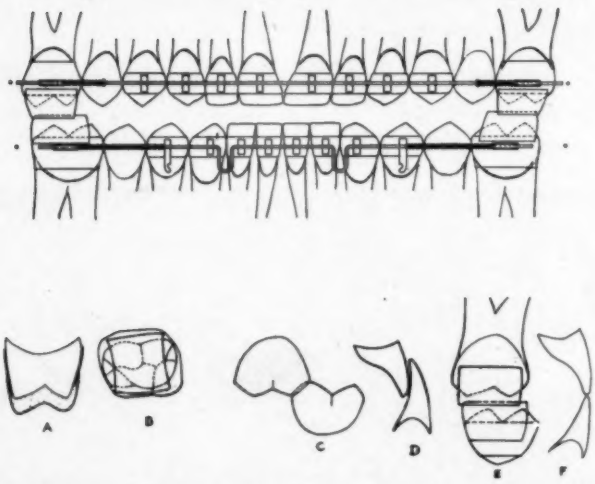

Fig. 4.—D. F. Appliances with occlusal belts on all first permanent molars. (See text for description.) Compare molar positions indicated in *C* and *E*. Compare anterior position indicated in *D* and *F*. The result of the placement of occlusal belts.

Two pairs of intermaxillary elastics are used (1) from the loops to the distal ends of the maxillary labial arch and (2) from the extension on the attachment of the mandibular first premolars which are so designed to engage elastics. These elastics are likewise attached to the distal end of the maxillary labial arch.

Coil springs may be used between the lower first premolar attachments and molar tubes to retain or increase the space for second premolars during elastic force.

The effects of the molar occlusal belts previously mentioned are indicated in the lower part of Fig. 4. Fig. 4*A* below is a buccolingual section of the occlusal belt filled in with cement. Note that it is soldered or welded to the

buccal and lingual surfaces of the band. *B* is an occlusal projection of the belt indicating the extent of the occlusal surface covered. *C* and *D* indicate diagrammatically the relation of molars and the incisors in this type of case where I think these belts are indicated. *E* and *F* demonstrate also the position that these same teeth assume when the occlusal belts are placed on the molar bands.

Fig. 5 is a sagittal cephalic x-ray before treatment. Fig. 6 is a sagittal cephalic x-ray of the same case after ten weeks of treatment.

Fig. 5. Fig. 6.

Fig. 5.—D. F., June 15, 1938. Sagittal cephalic x-ray before treatment. (See models, Figs. 1, 2, and 3.)

Fig. 6.—D. F., Sept. 1, 1938. Sagittal cephalic x-ray after treatment. (See models, Figs. 1, 2, and 3.)

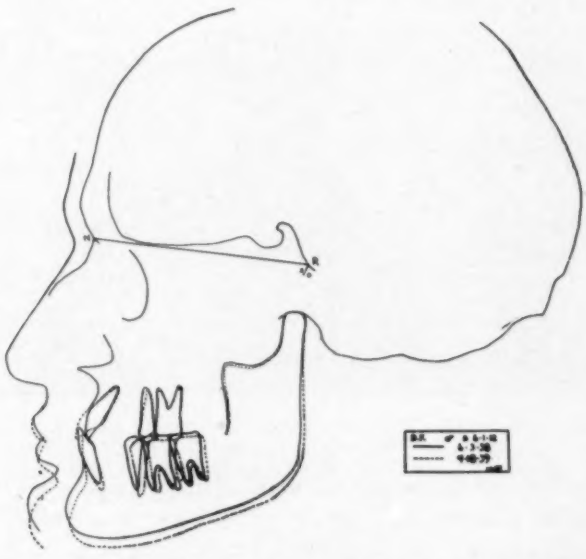

Fig. 7.—D. F. Composite tracings of sagittal x-rays. (See Figs. 5 and 6.)

The question has arisen whether in this type of case there has been an increase in the length of the face (Fig. 7). The composite tracing made from the previous x-rays indicates that it has, thus creating more space for the tongue.

The factors that tend to bring the mandibular teeth to more posterior positions are not posterior movement of these teeth by appliances, but are due to the following:

1. Downward and backward placement of the entire mandible due to the occlusal belts (Fig. 4).

2. The anterior movement of the maxillary incisors to position labial to the mandibular incisors brings the anterior segment of the plane of occlusion to a lower level, thus helping to keep the mandible down, therefore back (Figs. 4 and 7).

3. The vertical components of the forces of the intermaxillary elastics tend to further erupt the superior posterior teeth.

A. *B.*

Fig. 8.—D. F. Composite x-ray photographs. *A*, June 15, 1938. *B*, Sept. 1, 1938. (See x-rays, Figs. 5 and 6.)

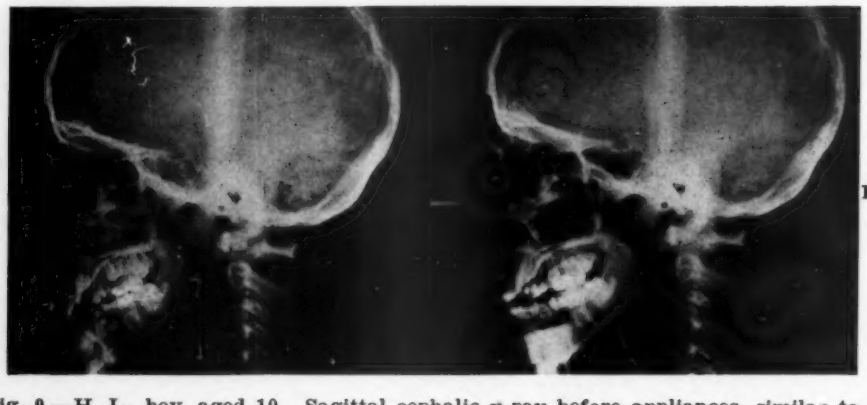

Fig. 9. Fig. 10.

Fig. 9.—H. L., boy, aged 10. Sagittal cephalic x-ray before appliances, similar to that in Fig. 4, were inserted.

Fig. 10.—H. L. Sagittal cephalic x-rays immediately after appliances had been inserted, illustrating the effects of the occlusal belts. Rotating the mandible inferiorly and posteriorly. (See Fig. 7.)

4. Removing the occlusal belts one at a time after the maxillary incisors are labial to the mandibular incisors permits each molar to erupt to occlusion without placing too much stress on the incisors in their new position. In other words, the mandible having been rotated downward and backward by the occlusal belts is retained in that position, and the actual tooth movement necessitated from the active appliance is minimized to the anterior teeth.

Figs. 8 *A* and *B* are composite x-ray photographs before and after ten weeks of active treatment.

Fig. 9 is a sagittal cephalic x-ray before treatment of a similar case of a boy, aged 10, before appliances were inserted.

Fig. 10 is a sagittal cephalic x-ray immediately after the appliances have been inserted. This appliance is similar to the one described in Fig. 4.

Figs. 11*A* and *B* are composite x-ray photographs of the two previous cephalic x-rays (Figs. 9 and 10). Note the immediate posterior and inferior placement of the mandible due to occlusal belts.

In Fig. 12 the upper set of models is of a boy, aged 11, made Oct. 16, 1939. This is a Class II, Division 1 Angle case. The middle set of models were made from impressions taken March 5, 1941, approximately seventeen months later when superior and inferior Hawley retainers were inserted (Fig. 13). Please note the absence of the maxillary second molars in the middle set of models. Fig. 14 is an anterior view.

Maxillary second molars were removed prior to treatment because of the general inflammation of the cheek and gums caused by the buccal displacement of one and the reaction to a biting habit. Close examination of the models will indicate at least one of those maxillary second molars to be only tricuspid in outline and rather small, while the third molars were excellent buds.

Fig. 11.—H. L. *A*, Composite x-ray photograph before appliances were inserted. (See x-ray Fig. 9.) *B*, Composite x-ray photographs made directly after appliances were inserted. (See x-ray Fig. 10.) Note immediate posterior and inferior placement of mandible due to occlusal belts.

Fig. 15 is a sagittal cephalic x-ray before treatment was started. Fig. 16 is a sagittal cephalic x-ray taken after active treatment. Please note that the unerupted third molars are more proximal to the second molars than in the previous x-ray. Was that caused entirely by the forward drift of the third molars?

Fig. 17 is a composite tracing of the two x-rays previously shown. Note that the maxillary molars have been moved posteriorly while the third molars have been moving anteriorly.

Added to this posterior relation of the maxillary molars after treatment to their position before treatment is the natural forward growth that these maxillary molars would assume during this period of active growth.

Therefore, intermaxillary force as well as the force from the arch wire not only causes posterior movement of the maxillary molars, but inhibits their forward growth.

Figs. 18*A* and *B* are composite x-ray photographs of the case previously shown before and after active treatment.

The third and final case deals with a description and application of a bite plane designed and used by the author for a period of several years.

Fig. 12.

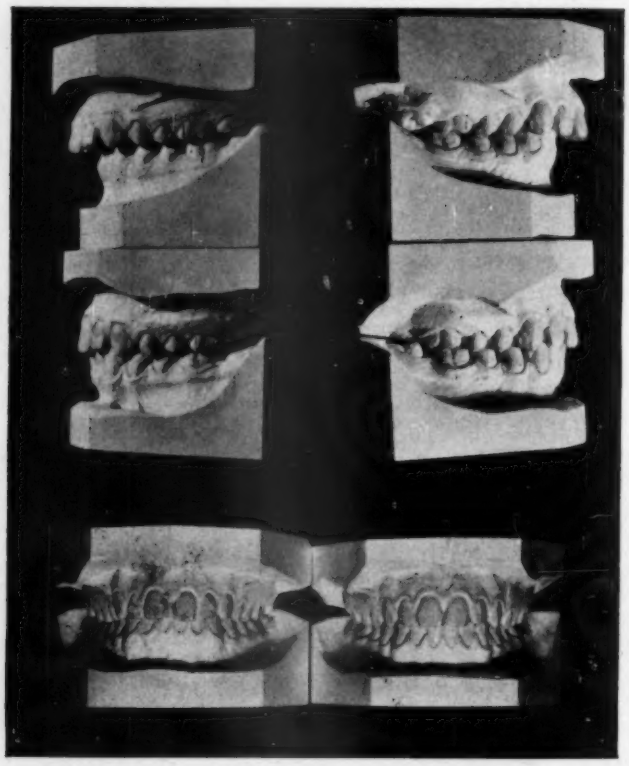

Fig. 13.

Fig. 14.

Fig. 12.—B. B., boy, aged 11. Class II, Division 1, Angle, before treatment, Oct. 16, 1939.

Fig. 13.—B. B., boy. Models, March 5, 1941, after appliances were removed and Hawley retainers were inserted. Note absence of second molars. (See Figs. 15 and 16 below.)

Fig. 14.—B. B., Set of models, anterior view of Figs. 12 and 13.

Fig. 15.

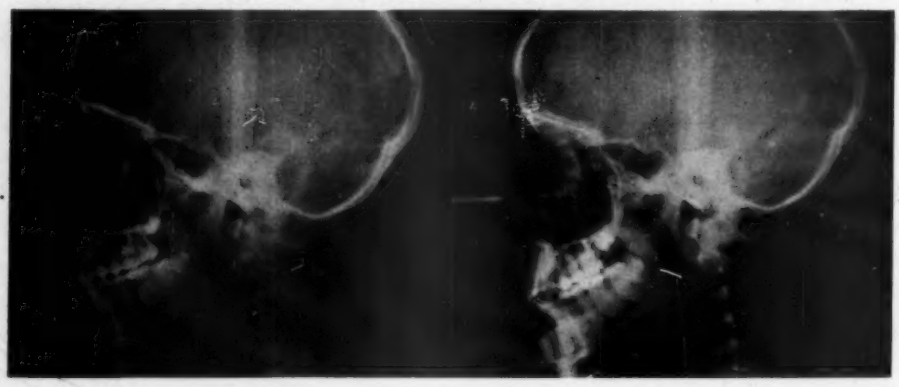

Fig. 16.

Fig. 15.—B. B. Sagittal cephalic x-rays, Oct. 16, 1939. (See models Fig. 12.)

Fig. 16.—B. B. Sagittal cephalic x-rays, March 5, 1941, before insertion of Hawley retainers. (See models Fig. 13.) Note that the maxillary molars have been removed and the forward migration of the unerupted mandibular third molars.

There are some orthodontists who never use bite-raising devices. Many more, however, feel that there are some indications for increasing vertical eruption of posterior teeth. There are cases of Class II, Division 2, Angle, in which there is no room for bracket placement on the mandibular incisors.

The above set of models is of a boy, aged 10, with a Class I Angle, labioversion of the premaxilla including the four incisors. The mandibular incisors were biting rather deeply into the gum palatal to the maxillary incisors causing some inflammation (Fig. 19). The upper models indicate the conditions before the bite plane was inserted. Bands with attachments having horizontal slots were fitted and cemented to the maxillary lateral incisors.

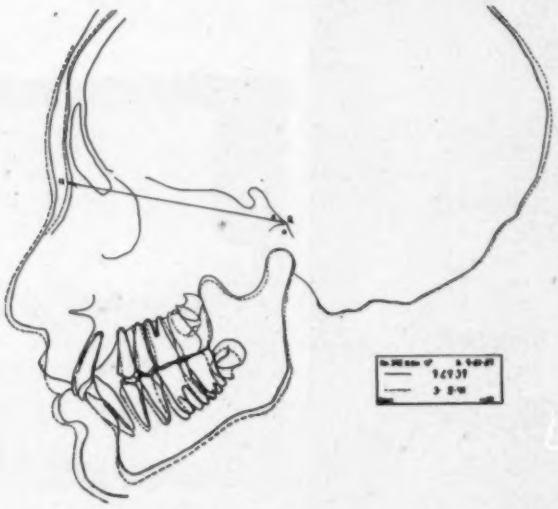

Fig. 17.—B. B. Composite tracings of the two x-rays, Figs. 15 and 16. Note posterior movement of maxillary teeth and forward drifting of maxillary third molars.

Fig. 18.—*A* and *B*, B. B. Composite x-ray photographs made from cephalic x-rays, Figs. 15 and 16.

A premaxillary fixed removable bite plane was inserted Oct. 27, 1939. This plane will be described later. After about eleven weeks the occlusion was relieved in the incisal region about 5 mm. as indicated in the lower set of models in Fig. 19.

Condition was retained until the first premolars (maxillary) had erupted, then the anterior maxillary incisors were retracted, as indicated in Fig. 20.

Fig. 21 shows the anterior views of the same case. Fig. 22 shows a composite tracing made from cephalic x-rays.

Note that the mandible has been rotated downward but that there has been a compensatory forward development of the mandible due to its release and the natural growth forces, also the vertical eruption of the maxillary posterior teeth which takes place when any sort of bite plane is inserted in the anterior section of the mouth.

Fig. 19.

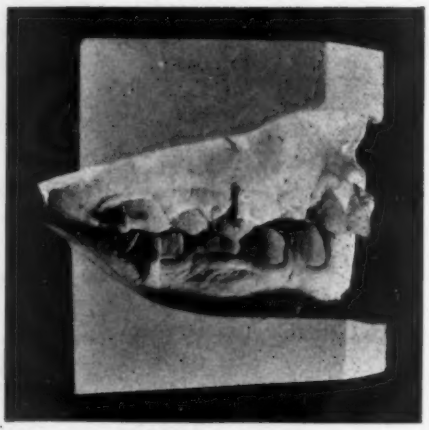

Fig. 20.

Fig. 19.—F. C., boy, aged 10, Oct. 27, 1939. Above. Class I, Angle. Before premaxillary fixed removable bite plane was inserted. Below. After bite plane had been worn about eleven weeks. Note change in vertical relation of maxillary incisors. At this stage bite plane was removed and appliances inserted to retract maxillary incisors. (See Fig. 20.)

Fig. 20.—F. C., Feb. 14, 1940. Maxillary incisors retracted. (See Fig. 19.)

Fig. 21.—F. C. Anterior views of Figs. 19 and 20.

Fig. 23 is an intraoral view of the premaxillary bite plane. Note the two bands on maxillary lateral incisors; also that the labial wire as seen through the acrylic resin is closely adapted to lingual surfaces of the maxillary lateral incisors. At this time we are placing little occlusal rests over the mesial mar-

ginal ridges of the first premolars, which are not seen in this view. There should be no contact between this plane and the gum because a "V" shaped space is cut out of the palatal portion of the plane so that it rests only on tooth surface.

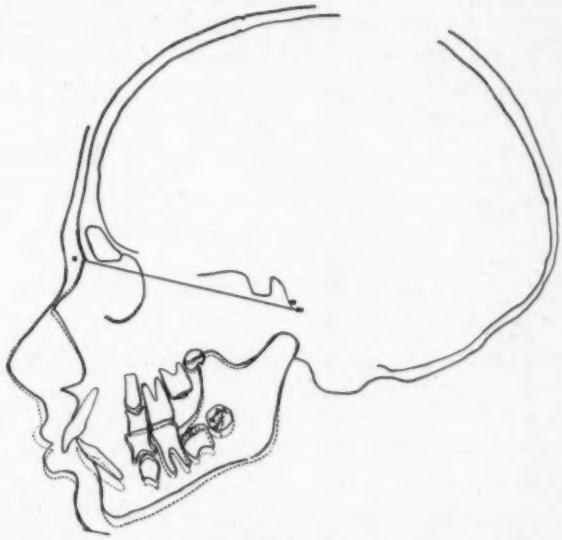

Fig. 22.—Composite tracings made from cephalic x-rays before premaxillary fixed removable bite plane was inserted and after it had been removed eleven weeks later. No. 322 ♂ ——— 10-27-39, age, 10 yr. 7½ mo. - - - - 1-13-40, age, 10 yr. 11 mo.

Fig. 23.

Fig. 24.

Fig. 23.—F. C. Premaxillary fixed removable bite plane, intraoral view. Rests on the mesial ridge of the first premolars whenever possible. Acrylic is cut away so that it rests only on tooth structure.

Fig. 24.—F. C. Premaxillary fixed removable bite plane, anterior view. Bands with attachments on lateral incisors. Labial wire, round .020, passes through slots in attachments and is buried in acrylic. Loops over incisors prevent rotation of appliance.

Fig. 24 is an anterior view of a bite plane. Note the labial wire is looped across the labial surface of the maxillary incisors and passes through horizontal slots on the attachments on the bands of the lateral incisors. These loops prevent rotation by two-point contact. This bite plane has been termed by the author the premaxillary fixed removable bite plane because it is supposed to remain in the mouth for twenty-four hours a day. It may be kept clean on the lingual surface by rinsing the mouth and forcing a mouthwash

underneath the plane which, as has been described before, does not come in contact with the gum. After the child has worn the appliance for two or three weeks, he or his mother or nurse may be taught how to snap the appliance out of the mouth so that it may be cleaned and replaced once a day.

It should be perfectly obvious that when indicated the effect of this device as compared to the removable type of Hawley retainer is much faster and easier on the patient after the first two or three days of breaking in.

Department of Orthodontic Abstracts and Reviews

Edited by

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The Evolution of Dental Occlusion From Fish to Man: By William K. Gregory, Ph.D., D.Sc., 1941, University of Pennsylvania Press, Philadelphia, Bicentennial Conference Bulletin, "Development of Occlusion," 1-30.

The term *occlusion* suggests that originally the word was applied to the tightly shut condition of the jaws, as, for example, in the word lockjaw, and that it was later extended to cover the normal spatial relations of the human upper and lower teeth when the jaws were "locked."

Teeth or tooth-like structures may be in highly effective positions without contact with anything but the food or prey. There must, however, usually be a common anchorage of some sort between upper and lower arms of a jaw system or between a jaw and the attacked object. All the occlusal relations of human teeth are dependent upon their being set in a fixed upper and a movable lower jaw.

In ordinary dental occlusion the jaws act as pincers or opposing levers attached to a single fulcrum, and the opposing teeth attack the object from opposite sides. We may also have an apparently unilateral arrangement in which a dental structure does not occlude with a similar antagonist, but may impinge only against the objective. In brief, dental occlusion in the ordinary sense is only a means to obtain effective contact of a dental or gnathal part with its objective.

If the food be tough and the animal is to live through many years, the permanent teeth or dental masses must continue to renew themselves at the base of the crown and the crowns must be both tough and high enough to outlast a long lifetime of wear. In practice, the wear of the dental parts upon each other, together with compensatory closing up of the entire row of molar crowns, actually helps to keep the dental arches as a whole in correct occlusion with each other.

An animal with perfect teeth and perfect occlusion of all parts of the teeth would usually have been blessed with an undamaged heredity, a suitable environment and a favorable individual history. On the other hand, serious malocclusion, especially if accompanied by defective teeth, would indicate something wrong either in heredity, environment, individual history, or all three. For properly occluding teeth to do any useful work, they must be well anchored or based on both the fixed and the movable arms of the pincers.

In vertebrates, jaws originated in the walls of the oralobranchial chamber. Long before there were any jaws at all the ancestors of the vertebrates were "food-sifters" and lived upon minute living particles, which were drawn into the mouth probably at first by the action of cilia.

In the sharks the underlying oralobranchial arches became enlarged into a great fish-trap while the surface layers of the dermal plates disintegrated into shark teeth which rest on "cartilage jaws."

By the time of the earlier reptiles the pits in which the labyrinthodont teeth were sunk at the base gradually changed into sockets and the labyrinthodont folds were gradually lost. These simple laniariform socketed teeth, which are seen in the earliest mammal-like reptiles, were set in jaws of a simple scissors-like type, in which the upper teeth overhung the lower teeth and sheared past them in simple vertical arcs. Since the teeth were at different distances from the fulcrum or quadrate-articular joint, their several leverages and moments of inertia differed accordingly, so that they began to exhibit at an early stage the functional differentiation into incisors, canines, premolars, and molars.

In the earlier adult mammals the dentary has become the sole bone of each half of the lower jaw and the premaxilla and maxilla together form the entire subocular surface of the face. The transition from this stage to that of man involves chiefly the deepening and anteroposterior shortening of these elements. In the mammals the further emphasis of this tendency resulted in the formation of the temporomandibular joint. This joint is highly characteristic of mammals and is not found in the ancestral lower reptiles and amphibians. This profound transformation made possible the highly diverse paths of the mandible and the consequent complexity of occlusal relationships of the teeth which is seen in the various orders of mammals.

The jaw muscles arose as specialized gill-arch muscles. In the higher mammal-like reptiles there was begun a movement to emancipate the jaw muscles proper from their hyoid and branchial companions. This was carried to an extreme in the mammals, and meanwhile the old fulcrum at the back of the compound jaws began to diminish, while a totally new joint was established between the ascending ramus of the dentary plate and the squamosal plate. This mandibulo-temporal joint, together with the increasing functional differentiation of the jaw musculature from that of the hyobranchial complex, determines all the many types of dental occlusion to be found in the mammals.

The upper molar cusps tended to become less sharp and stouter, the postero-internal corner tended to fill out, nearly obliterating the interdental embrasure. As this happened, the antero-internal cusp, or paraconid, disappeared from the lower molars, the talonids become more prominent, finally greatly exceeding the trigonid in size and importance.

In that branch of the primates to which man belongs, namely, the Catarrhinae, including the Old World monkeys, anthropoid apes and man, there was a tendency for the two main outer cusps of the upper molars to develop transverse ridges on their inner or lingual slopes and for the lower molars to develop two transverse crests, one on the remnants of the trigonid, the other on the talonid.

The discoveries of the last quarter-century in the field of fossil apes (Dryopithecinae), ape-men (Australopithecinae), and men, have brought forward much evidence as to the precise steps by which the general five-cusped "*Dryopithecus* pattern" of the lower molars gave rise on the one hand to the various molar patterns of the anthropoid apes, and on the other hand to the specialized and often retrogressive four-cusped pattern of human molars.

Obviously the dental arches as a whole must ordinarily be kept in occlusion, and as parts of these arches change their relationships, there are corresponding shifts in the occlusal relations of individual teeth. On the whole, the least altered parts are the incisors. The canines, both upper and lower were reduced, the anterior lower premolar crown was transformed from an obliquely oval to a more nearly symmetrical crown; the third molars, originally larger than the first, were variously reduced and often eliminated; the first lower molar became the dominant cheek tooth. Meanwhile, in advanced cases, the five-cusped *Dryopithecus* pattern broke down into the four-cusped plus pattern, while in the upper second and third molars the distolingual cusp became variously reduced or sometimes even disappeared.

In man, the whole front part of the dental arch has been retracted, the incisor teeth are more vertical, the canines greatly reduced in crown height and the tip of the lower canine is drawn within the general line of the upper front teeth. Thus, what would be judged as malocclusion in an ape has become normal occlusion in man.

We have to consider such facts as that the "dentition" as a whole is not static but is a collective name for a long series of events from the first forms of the tooth germs of the teeth until death. Consequently even in the individual we have a slowly changing pattern of occlusal relations. In typical mammals there are two prolonged but marked crises in development: first, that which culminates in the completion of the dental arches of the deciduous dentition; secondly, the completion of the dental arches of the permanent dentition. Finally, there is the contrast between the perfected dentition at maturity and its nearly worn out state in extreme old age. The problem is complicated by the fact that during the change from the deciduous to the permanent dentition the animal does not go into retirement; on the contrary, the change is effected during a long period of intense activity of the dental apparatus as a whole. How well or ill this transition is managed in the average American so that the effective occlusal relations are maintained as each deciduous tooth is gradually replaced by its successor is well known.

Factors Influencing Occlusion: By Milo Hellman, D.D.S., Sc.D., Symposium on "Development of Occlusion," The Bicentennial Celebration, University of Pennsylvania, Sept. 18, 1940; published by University of Pennsylvania Press, Philadelphia, 1941.

The "factors influencing occlusion" of the teeth in modern man are subject to two processes. One is the process of evolution, the other is that of individual development. To understand the significance of occlusion of the teeth in

man today, it is of importance to know the changes which brought it about. Like most phenomena in life, the teeth in man began with simple forms in primitive creatures many millions of years back.

Transformations in form and adaptations to changing conditions of life brought the dentition to its present stage in man. But this stage is not final. Changes in tooth form and occlusion still continue. They indicate that the processes operative now are of the same nature as those of the past. Further simplification in form of teeth and reduction in number of contact units appear to be the problem of occlusion now and the fate of it in the future.

Individual development reaffirms the direction of evolution. It emphasizes like facts derived from phylogeny by peculiarities observed in ontogeny. Thus disturbances in eruption of teeth, changes in the order of their succession, stretches in time of their acquisition, and modification in growth of the jaw bones contribute toward enhancing the effects of evolution by the vagaries of individual development. The task of the dental profession is to stem the tide of those forces which affect the dentition of man today. It is a full-time job and is being carried on with great vigor. Success depends upon continuous research, endless energy, devotion to the problem, and confidence in the future.

Holt's Diseases of Infancy and Childhood. A Textbook for the Use of Students and Practitioners: By the late L. Emmett Holt, M.D., and John Howland, M.D. Revised by L. Emmett Holt, Jr., M.D., Associate Professor of Pediatrics, Johns Hopkins University, and Associate Pediatrician to the Harriet Lane Home, Johns Hopkins Hospital, Baltimore, and Rustin McIntosh, M.D., Carpenter Professor of Pediatrics, Columbia University, and Director of the Pediatric Service in the Babies Hospital, New York City. Ed. 11, illustrated. Pp. 1421. Price $10.00. New York, D. Appleton-Century Co., 1939.

This standard work for almost half a century has again been revised, a task which engaged the efforts of thirty-three collaborators among whom are many of the outstanding pediatricians. In addition to his general interest in diseases of children as presented in this book, the orthodontist will be especially interested in the chapter on "Growth and Development; Nutrition and Deficiency Diseases." The sections on diseases of the mouth, nose, throat, and ears are especially germane to orthodontics. An interesting chapter is the one on malformations of the newborn in which congenital dentofacial malformations are discussed. Jaw anomalies due to certain pressures are explained. Lewis R. Stone, Associate Professor of Dentistry, Columbia University School of Dental and Oral Surgery, contributed the chapter on "Diseases of the Mouth." The book contains many excellent illustrations and a complete index.

J. A. S.

Annual Review of Physiology: By James Murray Luck, Editor, Stanford University, and Victor E. Hall, Associate Editor, Stanford University. Vol. III. Pp. 784. Price $5.00. Published by the American Physiological

Society and Annual Reviews, Inc., Stanford Univ. P. O.: California: Annual Reviews, Inc. 1941.

This volume presents a review of the outstanding contributions in the field of physiology. As a rule, appraisals of the work published in the several divisions of physiology are presented by the various editors who are of recognized standing in their respective specialties. Oral surgeons, dentists, and orthodontists will find the chapters on "Developmental Physiology" by E. Witschi, on "Growth" by C. E. Palmer and A. Ciocco, on "Muscle" by W. O. Fenn and on the "Endocrines" by Soskin and Riddle, of especial interest. Pain is discussed in the chapter on "Vibratory Sensations and Pain." Under this heading, vibratory itching and referred pain and hyperalgesia are discussed.

J. A. S.

A Text-Book of Oral Pathology for Students and Practitioners of Dentistry: By Russell W. Bunting, D.D.S., D.D.Sc., Professor of Dental Histology and Pathology, University of Michigan, Ann Arbor, Mich., and Thomas J. Hill, D.D.S., Professor of Clinical Oral Pathology and Therapeutics, Western Reserve University, Cleveland, Ohio. Ed. 2, thoroughly revised, Octavo, 460 pages, illustrated with 315 engravings and 1 color plate. Cloth, $6.50, net. Philadelphia, Lea & Febiger, 1940.

Included in this edition is a chapter on "Malocclusion of the Teeth and Dentofacial Deformities" by Dean B. E. Lischer, D.M.D., and one on "The Abnormal Development of the Oral Tissues" by Samuel W. Chase, Ph.D. Lischer discusses the norm concept in a manner which makes it of utmost importance to the orthodontist in his attempts to modify dentofacial anomalies. Lischer's chapter presents a basic discussion of the classification of orthodontic anomalies. Most of the pages of the book are devoted to the consideration of dental caries. This is as it should be in a book by two such outstanding authorities on the subject of caries as Bunting and Hill.

In the discussion of nonpurulent periapical infections the authors advise, "The production of dry sockets is the result of destruction, or failure of retention of the blood clot. This may be due to excessive packing, washing out of clot, or bacterial infection and destruction of clot. After destruction of the clot, bacterial infection occurs and a resultant mild osteomyelitis. Every effort should be made to retain clots after tooth removal."

Many practical suggestions are contained throughout the book. The historical approach to many of the pathologic conditions discussed will be found intensely interesting and will provide a background for the research worker into the development of research in oral pathology. Over 300 illustrations, numerous bibliographic references, and an adequate index are included.

J. A. S.

Editorial

Milo Hellman Retires From Practice

Though quite a surprise to his friends and confreres, the formal announcement that Milo Hellman has retired from the active practice of orthodontics was not entirely without plan and purpose. A more concentrated effort for orthodontic advancement will be the continued activities of Dr. Hellman subsequent to his retirement.

The news of his retirement was the inspiration for a checkup through twenty-six years of continuous publication of the AMERICAN JOURNAL OF ORTHODONTICS AND ORAL SURGERY. As a matter of interest, it was desired to ascertain how many original scientific contributions this author had made to orthodontics during this long period, that had been recorded in the bound volumes of the JOURNAL.

His first original manuscript was published in the former INTERNATIONAL JOURNAL OF ORTHODONTIA in 1917; subsequently through the years, including 1941, twenty-four original manuscripts have been recorded over Hellman's signature in this JOURNAL alone. In addition to this, he has contributed numerous scientific articles to many other medical and dental periodicals in both America and abroad; an actual count reveals at least sixty-two contributions, not to mention fifteen in collaboration with eminent scientists.

He has provided articles for numerous scientific journals apart from the medical and dental field, most pertaining to the subject of development of the face and jaws and the evolution of the teeth and occlusion.

In 1939, Dr. Hellman was presented with the Ketcham award. This award is selected annually and given to a member of the American Association of Orthodontists in recognition of outstanding contributions to the art and science of orthodontics. A partial record of the Hellman "influence" on orthodontics was published in the JOURNAL in the report of the Ketcham award for 1939 and was compiled at that time by the Award Committee of the A. A. O. Other honors conferred on him include an honorary Sc.D. from the University of Pennsylvania and from the University of Witwatersrand, Johannesburg, S. A.; F. A. C. D.; Sigma Xi; honorary citation presented by Associated Foundations in Laboratory of Anatomy, Western Reserve University, Cleveland; and member of the South African Expedition of the American Museum of Natural History, 1938.

It is interesting to note that the Hellman work has had much to do with making the orthodontist conscious of normal variability as distinguished from true dental anomalies. He has opposed strictly mechanical concepts of complex biologic things, and during the years, through his writings, has impressed upon orthodontists that the operator's correct concept of his problem is more important than mechanical dexterity as a means to an end in making corrections.

Plainly, the object in retiring from a busy practice is to gain more time for scientific work. He expects to give much attention to the vast collection of empirical facts, scientific records, and practical results that has accumulated but has not been put to practical application. He believes that this material should not be allowed to go by default and has decided to limit his orthodontic services to consultation for those in the profession who seek it and to the more vigorous pursuit of research. Science is obviously of little value if its implication in orthodontic practice is not clearly shown and if it is not made entirely applicable to those who are specializing in orthodontics.

This seems to be the job Dr. Hellman has outlined for himself in his retirement from active practice. THE AMERICAN JOURNAL OF ORTHODONTICS AND ORAL SURGERY will, no doubt, be joined by its readers in wishing Dr. Hellman continued success and happiness in his new work during future years in orthodontic research and advancement. His has been indeed a rich contribution to orthodontic literature.

H. C. P.

President's Page

MEMBERS OF THE AMERICAN ASSOCIATION OF ORTHODONTISTS:

The Forty-First Annual Meeting of the American Association of Orthodontists

The forty-first annual meeting of the American Association of Orthodontists will convene in New Orleans on March 17. The preceding day, Monday, will be devoted to the usual preliminary activities, such as golf and sight-seeing. This year, in particular, there will be afforded an unusual opportunity to those who would like to visit the historic spots or centers of interest in the city where the meeting is held, because New Orleans is one of the most historic spots in America. The famous French Quarter will certainly keep you busy for a full day. Also on Monday there will be held a meeting of the Board of Directors of the Association.

The scientific program will open on Tuesday morning with a welcome extended by the officials of the city of New Orleans and of the State of Louisiana. This welcome will be accepted on behalf of the Association by J. A. Burrill of Chicago, President-Elect.

As this meeting will assume an Inter-American aspect, we will, no doubt, have officials of the State Department with us. They will be presented by Oren A. Oliver of Nashville, President of the American Dental Association. A representative of the State Department will introduce the foreign guests who are present. We hope to have the pleasure of a response from many of these delegates.

The annual president's address will be the next in order. This is to be followed by a most interesting essay, the title of which is "Actualities of Orthodontics." This subject is to be presented by Joe Eby of New York, who is most able to present this phase of orthodontic practice.

The first speaker at the Tuesday afternoon session is Hermann Becks of the University of California. I would like to say to those who have not heard this man that you certainly have something to look forward to, and to those who have heard him I want to say that he will have some most interesting material to present.

The next subject to be presented is a symposium on the Third Molars (the Fifth Columnists of orthodontic practice). The first speaker will be B. Holly Broadbent of Cleveland, whose subject will be "The Effect of the Third Molars on Alignment of Teeth." He will be followed by Lucien Brun of Baltimore, an outstanding oral surgeon, who will discuss the subject from the viewpoint of the oral surgeon.

On Wednesday morning there will be presented what we think to be one of the most interesting symposiums that you have ever had the pleasure of hearing.

Let us caution you to be present at the beginning of this symposium or you will miss the entire trend of thought. The title of the symposium is:

The diagnosis and treatment of the dentofacial anomalies having the following characteristics, (a) both dental arches more narrow than normal; (b) protruding upper incisors, with all of the lower teeth occupying a posterior malrelationship to the upper, with the mandibular structures markedly arrested in development; (c) bimaxillary supraversion of the incisors, with the lowers in contact with the upper gingival tissues.

This symposium is being presented by a group of clinicians, none of whom employ the same method of therapy. The problem assigned for their discussion is a serious and frequently occurring dentofacial anomaly. It has been felt that the membership will profit by hearing their differing philosophies of treatment, and in being able to judge the character of results obtained.

The following men will take part in this symposium:

Dr. James D. McCoy, Los Angeles, Calif.
Dr. Russell E. Irish, Pittsburgh, Pa.
Dr. Samuel J. Lewis, Detroit, Mich.
Dr. Spencer R. Atkinson, Pasadena, Calif.
Dr. Joseph E. Johnson, Louisville, Ky.

Because of the Inter-American character of this meeting it was felt that it would be of great interest to the membership to have some of our Central and South American conferees appear on our program. We are most fortunate in securing Dr. Armando Monti of Buenos Aires. Dr. Monti is President of the Argentina Society of Orthodontists and is an author of a very extensive text on orthodontics. I am sure that everyone will deem it a great pleasure to have Dr. Monti appear on the program. His presentation will be the opening address on the Wednesday afternoon session.

Hermann Becks has such an extensive knowledge of the orthodontic problems associated with bone growth and development that it was felt we should have him appear at least twice on the program, and so as the closing paper on this afternoon's scientific session, it has been arranged for Dr. Becks to give another hour's lecture. This is to be followed by an executive session.

The subject of "Retention" may be classified as the saying about the weather, "There is much talk, but very little is being done about it." So the committee, after careful consideration, selected Dr. Ralph Waldron of Newark to present a paper entitled, "The Problems of Retention." We know that you will profit by hearing this discussion. Dr. Waldron will be the first speaker on the Thursday morning session.

Dr. Samuel Fastlicht of Mexico City will represent our fellow Central American orthodontists on the program. He will give a paper on "Root Resorption." This is a most vital question and should invite the attention of everyone.

The Albert H. Ketcham Memorial Award will command a conspicuous place on Thursday morning. One of the outstanding orthodontists of America will be honored at that time. It is very remarkable that as this is being written the votes of the committee have just been tabulated, and it is a distinct pleasure to announce that this year the vote was unanimous.

The subject of clinics is always one of great interest in every meeting. This year we believe that the clinics have been arranged in a satisfactory manner, and in such a way that everyone can derive the maximum amount of benefit from each. There will be six clinics presented on Thursday afternoon, full details of which will be announced later. We are sorry that we cannot give the full personnel of these group clinics at the present time, but they will appear in your program. We can announce the following directors of each clinic:

1. Open Tube Appliance Construction under the direction of Dr. James D. McCoy, Los Angeles, Calif.

2. Labio-Lingual Appliance Construction under the direction of Dr. Oren A. Oliver, Nashville, Tenn.

3. Edgewise Arch Appliance Construction under the direction of Dr. Samuel J. Lewis, Detroit, Mich.

4. Universal Arch Appliance Construction under the direction of Dr. Spencer R. Atkinson, Pasadena, Calif.

5. Twin-Arch Appliance Construction under the direction of Dr. Lowrie J. Porter, New York City.

6. Chrome Alloy Appliances under the direction of Dr. George H. Herbert, St. Louis, Mo.

We wish to give our sincere thanks to one of the most efficient program committees that the Association has ever had to serve them, namely: Earl Jones of Columbus, George Anderson of Baltimore, and Brooks Bell of Dallas. I wish to give full credit to these men for such an excellent program, and I know the membership joins me in this expression of thanks.

Yours sincerely,

CLAUDE R. WOOD, President.

The Inter-American Orthodontic Congress

You have seen the forty-first annual meeting referred to as a part of the Inter-American, or Pan-American, Orthodontic Congress. We had hoped to make a final announcement in this issue of the JOURNAL, giving complete details concerning the Congress which is to be a part of the annual meeting of the American Association of Orthodontists. But because of the emergency which has existed, it has delayed the formal announcement, and we are not in a position to give you definite information. Committees, however, have been selected in each of the twenty-one American Republics, and it is our hope that we will have representatives from each of these countries at the New Orleans meeting. If the Inter-American aspect proves to be a reality to the extent that we hope, there will be held a three-day postgraduate seminar following the annual meeting. This course while being given primarily for the representatives of the Central and South American countries will be open to orthodontists in America. We are not in a position to give you at this time a complete outline of this three-day course, but we would like to say that it will be one of the most complete postgraduate courses ever offered in this limited time. It is planned to have

the six clinics to be presented at the meeting of the A. A. O. as the basic part of the technical phase of this course. It is to be augmented by lectures, which will be given by outstanding orthodontists of the country. So it will be worth your while to keep this in mind in planning your time allotment for the New Orleans meeting.

The facilities of the Army Dental School have been offered, and there is a plan in the making for a six-day postgraduate course in general dentistry for the visiting representatives from Central and South America. This phase is being arranged by Brigadier-General L. C. Fairbank, Chief of the Dental Corp of the U. S. Army, a fellow member of the A. A. O.

The State Department of our Government is very much interested in this project, and we hope to see at an early date a consummation of all details so that you can be informed.

The entertainment feature of the Congress will not be lacking, and if we have our fellow American representatives present, there will be given a formal banquet in their honor, as well as other entertainment.

The Inter-Relations Committee, with John W. Ross of Philadelphia as Chairman, has been doing an exceedingly great amount of work in connection with the Congress. If the Congress is a success, most of the credit should go to this man for his untiring efforts.

Dr. Andrew F. Jackson of Philadelphia has been named Chairman of the Reception Committee for the Inter-American delegates and has been making definite plans, with which you will be acquainted.

We hope the members of the A. A. O. will extend every effort to make this meeting a success—one of which we will be proud, and make every delegate feel that the word Inter-American means everything for which it stands.

We wish to extend a most cordial invitation to all fellow dentists and orthodontists of each and every one of the twenty-one American Republics to meet with us in New Orleans on March 16, 1942. If we can help arrange your itinerary or reservations, do not hesitate to call upon us.

Yours sincerely,

CLAUDE R. WOOD,

President American Association of Orthodontists

News and Notes

American Association of Orthodontists

The 1942 meeting of the American Association of Orthodontists will be held at the Roosevelt Hotel, New Orleans, La., March 16 to 19, 1942. This will be a Pan-American Congress. A very special invitation is extended to orthodontists in Central and South America.

Five-State Postgraduate Clinic

The annual Five-State Postgraduate Clinic of the District of Columbia Dental Society will convene at the Mayflower Hotel, Washington, D. C., March 8 to 12, 1942.

Southern Society of Orthodontists

The next annual meeting of the Southern Society of Orthodontists will be held in conjunction with that of the American Association of Orthodontists in New Orleans on March 16 to 19, inclusive. There will be no scientific program arranged separately so that members can attend the meetings of the American. There will, however, be a short business meeting sometime during the sessions, details of which will be announced later.

E. C. LUNSFORD, Secretary.

New York Society of Orthodontists

The annual meeting of the New York Society of Orthodontists will be held at the Waldorf-Astoria in New York City, on Feb. 23 and 24, 1942.

WILLIAM C. KELLER, Secretary.

Southwestern Society of Orthodontists

The February, 1942, meeting of the Southwestern Society of Orthodontists has been postponed; however a regular business session will be held during the meeting of the American Association of Orthodontists in New Orleans, March 16 to 19, 1942.

R. E. OLSON, Secretary.

Cleveland Dental Society

The annual spring Clinic Meeting of the Cleveland Dental Society will be held May 4 to 6, 1942, at the Statler Hotel, Cleveland, Ohio.

Rocky Mountain Society of Orthodontists

The next meeting of the Rocky Mountain Society of Orthodontists will be held at 10 A.M., Jan. 7, 1942, at the Denver Athletic Club.

CURTIS L. BENIGHT, Secretary.

Orthodontic Directory

The twelfth edition of the *Orthodontic Directory of the World* is now being compiled. Those who have not been listed in the previous editions may write for a questionnaire which will be submitted to a board to pass on the qualifications for listing. All forms will be closed Feb. 1, 1942.

CLAUDE R. WOOD, Editor
Medical Arts Building
Knoxville, Tenn.

Note of Interest

Dr. John Sage announces the removal of his offices from 133 East 58th Street, New York City, to the Warren Apartments, 133-33 Sanford Avenue, Flushing, L. I. Practice limited to orthodontics.

OFFICERS OF ORTHODONTIC SOCIETIES*

American Association of Orthodontists

President, Claude R. Wood - - - - - - - - 608 Medical Arts Bldg., Knoxville, Tenn.
Secretary-Treasurer, Max E. Ernst - - - 1250 Lowry Medical Arts Bldg., St. Paul, Minn.
Public Relations Bureau Director, Dwight Anderson
- - - - - - - - - - - - - - - - - - 292 Madison Ave., New York, N. Y.

Central Association of Orthodontists

President, Harold J. Noyes - - - - - - - - - 55 E. Washington St., Chicago, Ill.
Secretary-Treasurer, L. B. Higley - - - - - - - 705 Summit Ave., Iowa City, Iowa

Great Lakes Society of Orthodontists

President, Henry D. Cossitt - - - - - - - - - 942 Nicholas Bldg., Toledo, Ohio
Secretary-Treasurer, C. Edward Martinek - - - - - - 660 Fisher Bldg., Detroit, Mich.

New York Society of Orthodontists

President, Sidney E. Riesner - - - - - - - - - 136 E. 36th St., New York, N. Y.
Secretary-Treasurer, William C. Keller - - - - 40 E. Forty-Ninth St., New York, N. Y.

Pacific Coast Society of Orthodontists

President, Ben L. Reese - - - - - - - - - - Roosevelt Bldg., Los Angeles, Calif.
Secretary-Treasurer, Earl F. Lussier - - - - - 450 Sutter St., San Francisco, Calif.

Rocky Mountain Society of Orthodontists

President, George H. Siersma - - - - - - - - -1232 Republic Bldg., Denver, Colo.
Secretary-Treasurer, Curtis L. Benight - - - - - - 1001 Republic Bldg., Denver, Colo.

Southern Society of Orthodontists

President, W. P. Wood, Jr. - - - - - - - - - 442 W. Lafayette St., Tampa, Fla.
Secretary-Treasurer, E. C. Lunsford - - - - - - 2742 Biscayne Blvd., Miami, Fla.

Southwestern Society of Orthodontists

President, E. Forris Woodring - - - - - - - - - Medical Arts Bldg., Tulsa, Okla.
Secretary-Treasurer, R. E. Olson - - - - - - Union Nat'l Bank Bldg., Wichita, Kan.

American Board of Orthodontics

President, Charles R. Baker - - - - - - - - - 636 Church St., Evanston, Ill.
Vice-President, Frederic T. Murlless, Jr. - - - - 43 Farmington Ave., Hartford, Conn.
Secretary, Bernard G. DeVries - - - - - - - Medical Arts Bldg., Minneapolis, Minn.
Treasurer, Oliver W. White - - - - - - - - 213 David Whitney Bldg., Detroit, Mich.
William E. Flesher - - - - 806 Medical Arts Bldg., Oklahoma City, Okla.
James D. McCoy - - - - - - - - 3839 Wilshire Blvd., Los Angeles, Calif.
Joseph D. Eby - - - - - - - - - 121 E. 60th St., New York, N. Y.

Harvard Society of Orthodontists

President, Harold J. Nice - - - - - - - - - 475 Commonwealth Ave., Boston, Mass.
Secretary-Treasurer, Edward I. Silver - - - - - - - 80 Boylston St., Boston, Mass.

Washington-Baltimore Society of Orthodontists

President, Paul W. Hoffman - - - - - - - - 1835 Eye St., N. W., Washington, D. C.
Secretary-Treasurer, Stephen C. Hopkins - - - - - 1726 Eye St., Washington, D. C.

Foreign Societies†

British Society for the Study of Orthodontics

President, S. A. Riddett
Secretary, R. Cutler
Treasurer, Harold Chapman

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*The Journal will make changes or additions to the above list when notified by the secretary-treasurer of the various societies. In the event societies desire more complete publication of the names of officers, this will be done upon receipt of the names from the secretary-treasurer.

†The Journal will publish the names of the president and secretary-treasurer of foreign orthodontic societies if the information is sent direct to the editor, 8022 Forsythe, St. Louis, Mo., U. S. A.

DR. CLAUDE R. WOOD OF KNOXVILLE, TENN., PRESIDENT OF THE AMERICAN ASSOCIATION OF ORTHODONTISTS.